

Course: Fundamentals of Seismic Design
Lecturers: Sri Sritharan, Katrin Beyer
Date: 3.1.2018 - 30.1.2018
Classroom: Sala del Camino; classroom 1-15 @IUSS

Course schedule

Week	Date	Lecture hours		Tutorial hours		Subject
		From To	From To	From To	From To	
1 Sala del Camino	3.1.2018	9-12:30		14-16:00		Conceptual seismic design (SS)
	4.1.2018	9-12:30		14-16:00		Section analysis of RC members (SS)
	5.1.2018	9-12:30		14-16:00		Plastic hinge analysis (SS)
2 Sala del Camino except for 9.1 (Cl. 1-15)	8.1.2018	9-12:30		14-16:00		Response spectra, strength and ductility (SS)
	9.1.2018	9-12:30		14-16:00		Force-based design, capacity design principles (SS)
	10.1.2018	9-12:30				Capacity design principles II, Pushover analysis (SS)
	11.1.2018	9-12:30				Shear design (SS)
	12.1.2018	9-12:30				Midterm exam (SS)
3 Sala del Camino	15.1.2018	9-12:30		14-16:00		Introduction to performance-based design (KB)
	16.1.2018	9-12:30		14-16:00		Direct displacement-based design (KB)
	17.1.2018	9-12:30		14-16:00		Application of DDBD to different structural systems I (KB)
	18.1.2018					No class
	19.1.2018	9-12:30				Application of DDBD to different structural systems II (KB)
4 Classroom 1-15	22.1.2018	9-12:30		14-16:00		N2 method, DDBA (KB)
	23.1.2018	9-12:30		14-16:00		DB assessment of unreinforced masonry buildings I (KB)
	24.1.2018	9-12:30				DB assessment of unreinforced masonry buildings II (KB)
	25.1.2018					No class
	26.1.2018	9-12:30		14-16:00		Project presentations (KB, SS)
5 Classroom 1-15	29.1.2018	9-12:30				Q & A session
	30.1.2018	9-12:30				Final exam (KB)

Brief Contents Description and Course Syllabus: The course will introduce and compare force-based and displacement-based seismic design approaches for seismic design including the direct-displacement based design method. Capacity design principles, necessary to ensure satisfactory and dependable seismic responses of structures, will be discussed and used as the basis for both design approaches. Following the coverage on conceptual design, the main focus of the course will be on reinforced concrete (RC) structures. The moment-curvature relationships of RC member sections and their transformation into force-deformation relationships for the members including the estimation of shear deformations will be discussed. Examples of RC structures will be designed using the different methods introduced in the course and their seismic behaviour will be verified by means of non-linear time-history analysis.

Reading material:

Priestley MJN, Calvi GM, Kowalsky MJ. (2007) "Displacement-Based Seismic Design of Structures," IUSS Press, Pavia, Italy. → This book can be purchased at the secretary's office.

Further reading material will be distributed during class.