

Name	Class hours	CD	Short Description	Info
<i>Hydroclimatic Modeling with AI: Open Data and Tools</i>	15	3	<i>This intensive 15-hour course is designed to equip PhD students with the essential skills to harness the power of open-source tools, machine learning, and artificial intelligence for analyzing large spatial open datasets (e.g. climate model outputs; remote sensing data; socioeconomic data). Participants will learn to model environmental design variables, with a specific focus on hydroclimatic ones, and develop applications for informed territorial planning and design. Through a blend of theoretical concepts and practical exercises, students will gain a deep understanding of AI-aided analysis of open datasets and its applications in sustainable infrastructure engineering.</i>	CEAR-01/B [ICAR/02] Reference person: Attilio Castellarin October 12-15 From 2:00 PM to 5:45 PM
<i>Transport systems for urban sustainable mobility</i>	15	3	<i>"The course provides an advanced understanding of transportation system planning and design by introducing challenges, emerging trends and innovative solutions from the methodological perspective of transportation system engineering.</i> <i>Participants will be provided with theoretical frameworks and case studies for designing efficient, effective transportation systems".</i>	CEAR-03/B [ICAR/05] Reference person: Maria Nadia Postorino Luca Mantecchini Thursday, September 17, 9:30 AM - 1:30 PM Wednesday, September 23, 1:30 PM - 4:30 PM Thursday, September 24, 9:30 AM - 1:30 PM Wednesday, September 30, 1:30 PM - 5:30 PM

<i>Advance in spatial data handling and GIS</i>	15	3	<i>The course aims at introducing key elements of advanced spatial data handling and Geographic Information System (GIS). The lessons will focus on presentation of Geographic Information System (GIS), metadata and open data, vector data processing and integration, database and data formats, raster data and imagery. Lessons include hand-on practice in data handling (exercises), with use of different approaches and software, and examples of application of interest for civil and environmental engineering applications.</i>	CEAR-04 [ICAR/06] Reference person: Emanuele Mandanici, Alessandro Lambertini 15 hours divided into 5 modules of 3 hours each: starting at 9:30 and ending at 12:30 Lesson modules delivered in September 2026: Thursday 10: Geographic Information System introduction Tuesday 15: Metadata and Open Data Thursday 17: Vector data processing and integration Tuesday 22: Database and data formats Thursday 24: Raster data and imagery Tuesday 29 is a backup date in case of unforeseen events or conflicts with institutional commitments that cannot be postponed on previous dates
<i>Design of building structures with fluid-viscous dampers:</i>	15	3	<i>The course introduces the principles of passive control of the seismic response of building structures by energy dissipation. The attention is paid on the fluid-viscous damper devices and their advantages for both design of new buildings and seismic improvement/updating of existing ones. Two different arrangements are considered: inter-storey dissipative braces (Stiffness Proportional Damping system) and</i>	CEAR-07/A [ICAR/09] Reference person: Stefano Silvestri, Giada Gasparini, Michele Palermo

from theory to practice			<i>dissipative links to external stiff towers (Mass Proportional Damping system). A simplified design procedure for structures equipped with viscous dampers is fully described, from theory to practice, including the discussion of modelling techniques in SAP2000 software. Several real applications are finally illustrated.</i>	Tuesday, October 27, 9:00 am–1:00 pm, LAMC classroom (4 hours) - Theory, Professor Stefano Silvestri Wednesday, October 28, 9:00 am–1:00 pm, LAMC classroom (4 hours) - Theory, Professor Michele Palermo Thursday, October 29, 9:00 am–1:00 pm and 2:00–5:00 pm, LAMC classroom (7 hours) - Practice (SAP2000), Professor Stefano Silvestri and Professor Michele Palermo
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