

CONCEPTUAL DESIGN OF REINFORCED CONCRETE STRUCTURES FOR DURABILITY AND CARBON EMISSION REDUCTION

From early design choices to
life-cycle performance of structures


DURABILITY
BY DESIGN


SAFE, ROBUST
& INSPECTABLE


LOW CARBON
SOLUTIONS


LIFE-CYCLE
PERSPECTIVE

TARGET AUDIENCE AND WHY THEY SHOULD ATTEND


GRADUATE AND PHD STUDENTS
IN CIVIL AND STRUCTURAL ENGINEERING

Students will learn how to move from theory and calculations to real engineering decisions, understanding how early design choices control durability, sustainability and structural performance. The course will enhance their ability to approach complex design problems and prepare them for professional practice.


STRUCTURAL ENGINEERS
AND DESIGN CONSULTANTS

For practising engineers, the course offers a rare opportunity to refine the most critical phase of the design process: the phase before calculations begin. Participants will gain advanced tools to make better choices in structural schemes, reinforced concrete design, durability and low-carbon solutions. This leads directly to more robust, more durable and more competitive designs, as well as lower life-cycle costs and environmental impact.


DATES AND VENUE
7 – 8 MAY 2026

MANFREDI ROMANO LECTURE HALL
Department of Structures for Engineering
and Architecture (DIST)

UNIVERSITY OF NAPLES FEDERICO II
Via Claudio 21, Naples, Italy

DESCRIPTION

The course provides an integrated view of structural conceptual design, with a specific focus on reinforced concrete, the most widely used material for infrastructures and at the same time the one most affected by problems of **durability, maintenance and environmental impact**.

Decisions taken during the conceptual design phase—structural scheme, geometry, force paths, detailing philosophy—largely determine not only **structural safety and efficiency**, but also the **service life, maintenance costs** and **carbon footprint** of a structure.

The course is addressed to graduate students, PhD candidates, professional structural engineers and infrastructure managers, and aims to provide an advanced design perspective that combines structural engineering, sustainability and durability. Through contributions from internationally recognised experts, both theoretical principles and real case studies on **bridges and reinforced concrete infrastructures** will be discussed.

Programme

Thursday 7th May

14:15 – Opening
Emidio Nigro, *Director of DIST*
Andrea Prota, *President of Polytechnic and Basic Sciences School*



Carmen Andrade - *Universidad Politécnica de Madrid (Spain)*
Professor Emerita and one of the world's leading specialists on reinforced concrete durability and steel corrosion. Her research has had a major impact on international standards and performance-based design for service life.

14:30 – 15:30 - Akio Kasuga
Conceptual design and carbon footprint reduction



Akio Kasuga - *The University of Tokyo (Japan)*
Senior structural engineer responsible for technology and sustainability strategies of one of Japan's leading construction companies. His work focuses on low-carbon design of reinforced concrete structures, geometric optimisation and life-cycle-based engineering. Currently Senior Principal Researcher at the University of Tokyo

15:30 – 17:30 - Tobia Zordan
Sustainability of structures

Friday 8th May

09:30 – 13:00 - Carmen Andrade
Durability of reinforced concrete as a design driver



Tobia Zordan - *Bolina Ingegneria (Italy)*
PhD structural engineer, with international teaching experience. He is President of BOLINA Ingegneria, a leading Company specialized in special and complex structures. He has been President of the IABSE Foundation, Chair of the IABSE TC and is actively involved in advancing international standards, having also chaired the European Technical Commission CEN TC340 for the harmonized Standard EN15129 on anti-seismic devices.

14:30 – 17:00 - Akio Kasuga
Low-Carbon design of Reinforced Concrete infrastructures