Ph.D. programme in Civil Systems Engineering

Innovation, technology and construction. Design for climate change

prof. eng. Gigliola Ausiello, eng. Francesco Sommese

Credits: 3 CFU
Number of hours: 18 frontal hours
Data: 21, 28 January 2025, 4, 11, 18, 25 February 2025

Objectives:
The main aim of the course is to encourage students to design sustainably in order to reduce the impact of buildings on the environment. By analysing cutting-edge technologies, advanced materials and digital construction techniques, the course explores the latest frontiers of sustainable architecture to design innovative buildings that can meet the challenges of climate change.

Course programme:
Different themes will be approached though a set of invited lectures that deal with sustainable building design:

- Bioclimatic design and architecture: passive solar systems
- Adaptive technologies for building envelopes
- Advanced materials for energy efficiency
- Regenerative design for urban microclimates
- Technologies for reducing carbon footprint
- Automated and digital construction processes

Assessment methods: Final interview

Contact for information:
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Lectures Program

N	Date	Schedule	Duration	Teacher	Topic
1	21/01/25	14:30 - 17:30	3 hours	G. Ausiello	Bioclimatic design and architecture: identification of design strategies and technologies with free energy inputs and design of passive solar systems.
2	28/01/25	14:30 - 17:30	3 hours	F. Sommese	Climate adaptive building envelope. Kinetic façade: motion actuators and intelligent materials.
3	04/02/25	14:30 - 17:30	3 hours	G. Ausiello	Phase Change Materials: artificial and programmable inertia in facades and horizontal and vertical intermediate partitions.
4	11/02/25	14:30 - 17:30	3 hours	F. Sommese	Bio-inspired design for climate adaptation. Nature-based solutions for the built environment: green roofs and green façades.
5	18/02/25	14:30 - 17:30	3 hours	G. Ausiello	Technologies of cellular glass (gravel and insulating panels), special glass (passive glass, active glass and intelligent technologies). Structural glass (applications in beams, pillars, facades, intermediate supports and stairs).
6	25/02/25	14:30 - 17:30	3 hours	F. Sommese	Advanced construction techniques: 3D and 4D printing. Computer-aided digital design and digital prefabrication.

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