



# Escola de Camins

Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports

UPC BARCELONATECH

# Doctoral Studies at CIVIL ENGINEERING SCHOOL, UPC

**Pavel Ryzhakov**

April 15, 2026 Barcelona

## UPC today

23.484

estudiants de grau

5.375

estudiants de màster

2.284

doctorands i doctorandes

57

estudis de grau

87

programes de màster

46

programes de doctorat



WORLD

QS World University Rankings  
by Subject 2024

**#29 – #35**

in Civil & Structural Engineering

Top ~40 in the world  
in Civil Engineering.



SPAIN

QS World University Rankings  
by Subject 2024

**#1**

in Civil & Structural Engineering

National leader  
in Civil Engineering.



EUROPE

QS-based positioning  
across recent editions

**TOP 5 – 10**

in Civil & Structural Engineering

Consistently among the  
top 10 universities in Europe.



### ENVIRONMENTAL ENGINEERING NOTE:

Rankings usually evaluate Civil & Structural Engineering separately from Environmental Sciences. In Environmental Sciences, UPC typically ranks around **#150 – #200 worldwide**, reflecting a strong performance in the field.

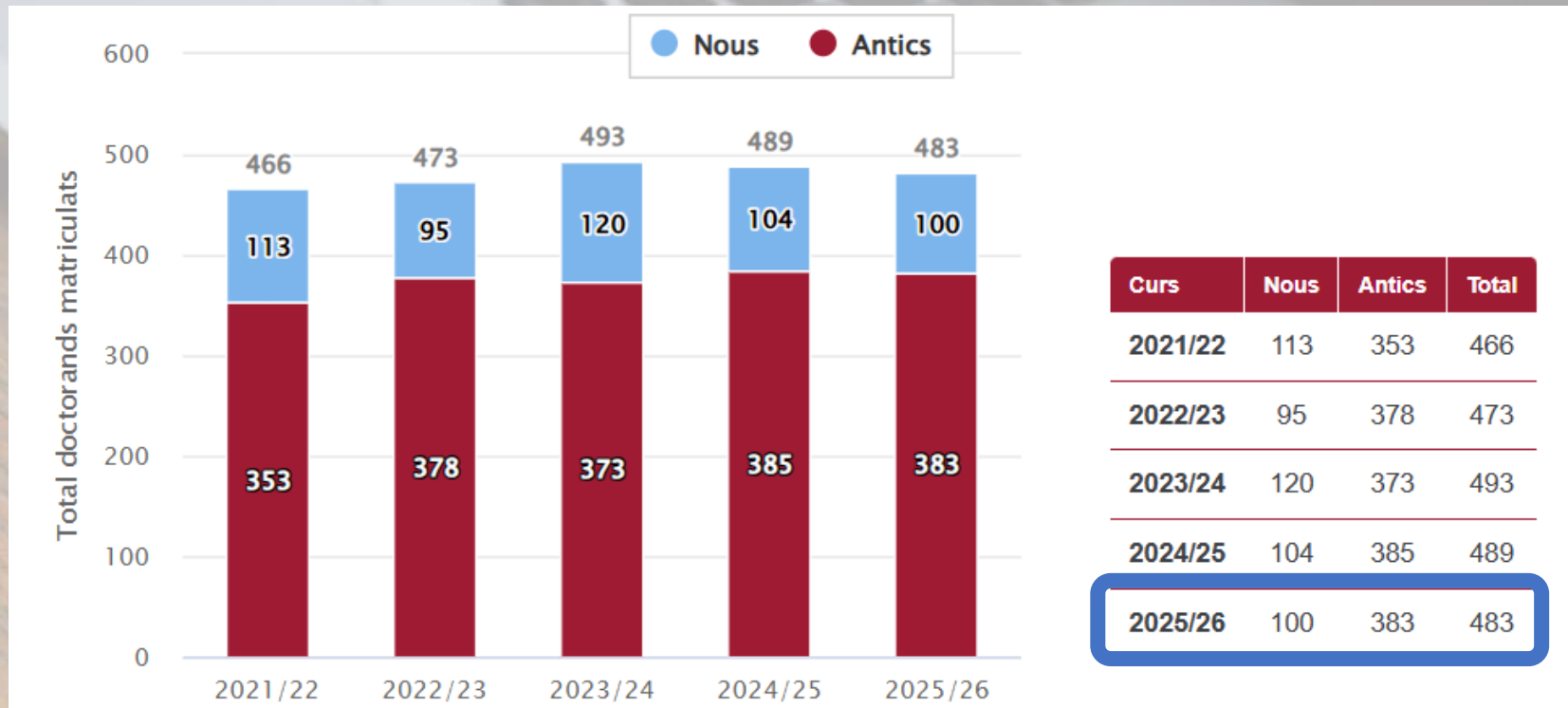


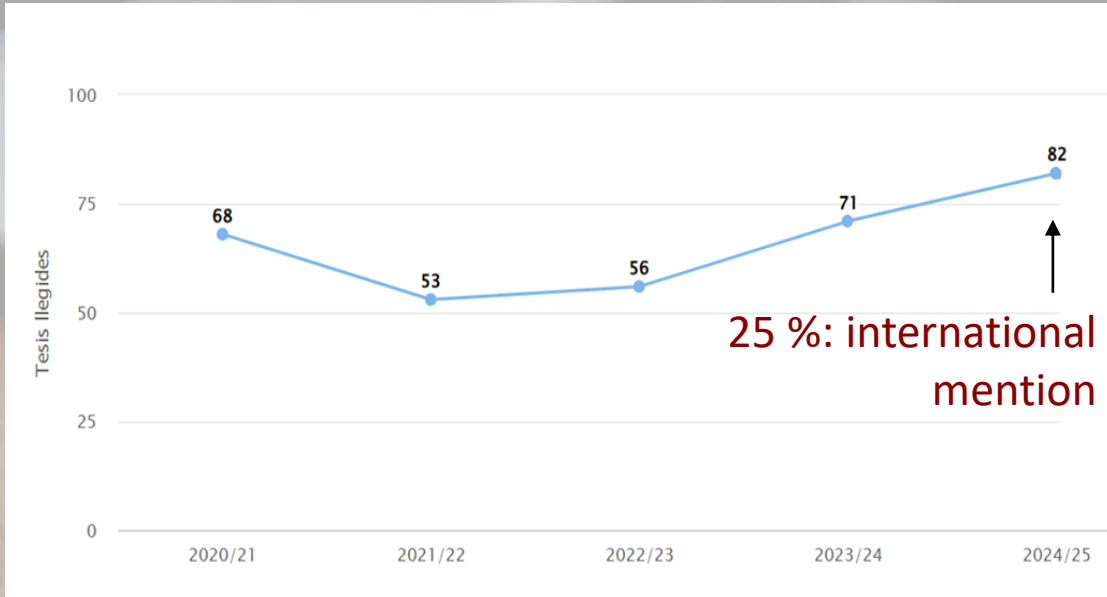
### KEY TAKEAWAY:

UPC is a world-class university in Civil Engineering, **#1 in Spain** and consistently a **Top 10 university in Europe**.

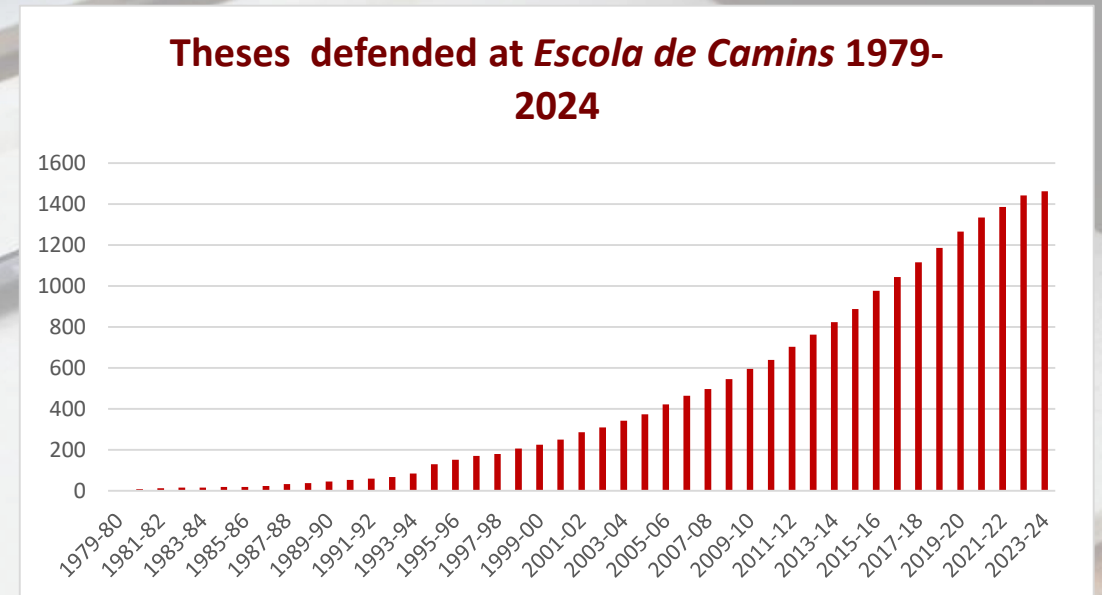
## 2021-2026

**Number of PhD students enrolled: 21% of UPC PhD students**





**82 PhD theses defended in academic year 2024/25**

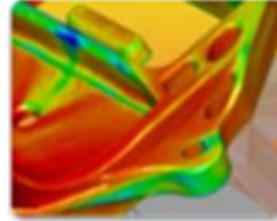


**1542 theses defended since 1980**

## PhD programs in the area “Civil & Environmental”



Civil Engineering



Structural Analysis



Marine Sciences



Environmental Engineering



Construction Engineering



Sustainability



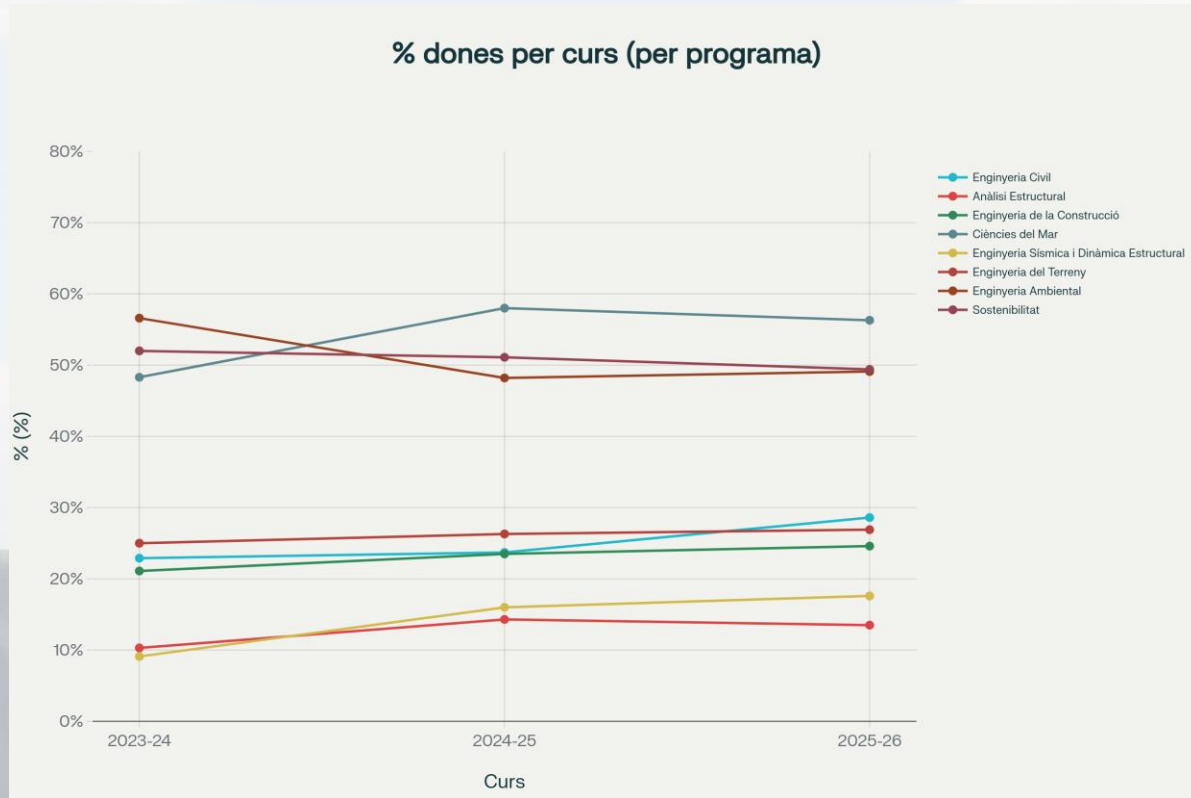
Earthquake Engineering & Structural  
Dynamics



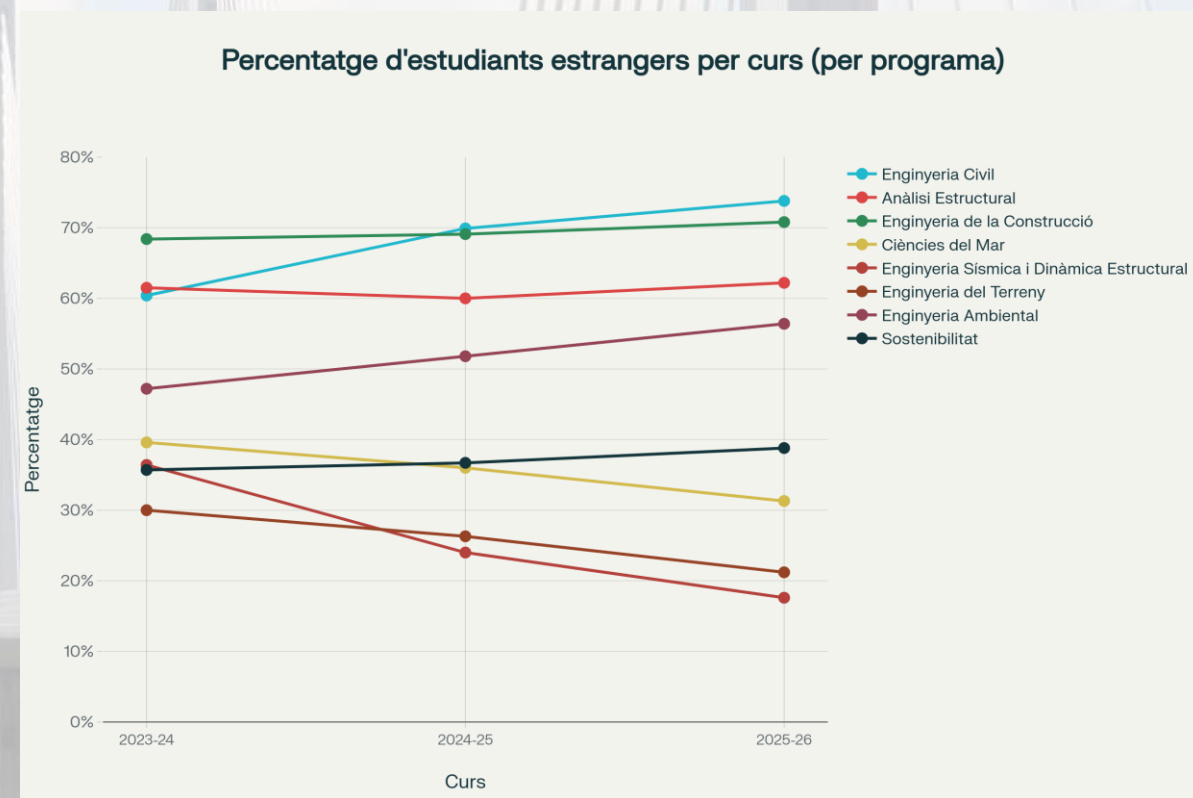
Geotechnical Engineering

**21 % of total PhD students  
of the UPC are with us**

## Presence of women: overall ca. 35 %



## Presence of international candidates: overall ca. 50%



**All doctoral programs, area «Civil and Environmental»**

## Structural Technology

- Low-cost **inspection**, monitoring, and assessment of **bridges** and structures
- Sustainable construction and **smart structures**
- Experimental and computational analysis of **historical**, concrete, and steel structures
- **Decision-making** models
- **Offshore** structures for wind turbines



## Construction Materials

- **Reuse, recycling**, and valorization of waste
- **New** low-carbon and durable **materials**



## Research and innovation in industrialized construction

- Contribution to **decarbonization**, resilience, circularity, and the digital transformation of the built environment. It connects operational performance with life-cycle impacts and with the digital infrastructures required to scale solutions across the built asset stock.

**Coordinator: Prof. Gonzalo Ramos**

The research carried out by doctoral candidates in the Structural Analysis Program is organized into four main research lines:

## Analysis and design of structures

- Civil structures
- Automotive/aerosp. structures
- Naval structures

## Analysis and design of materials

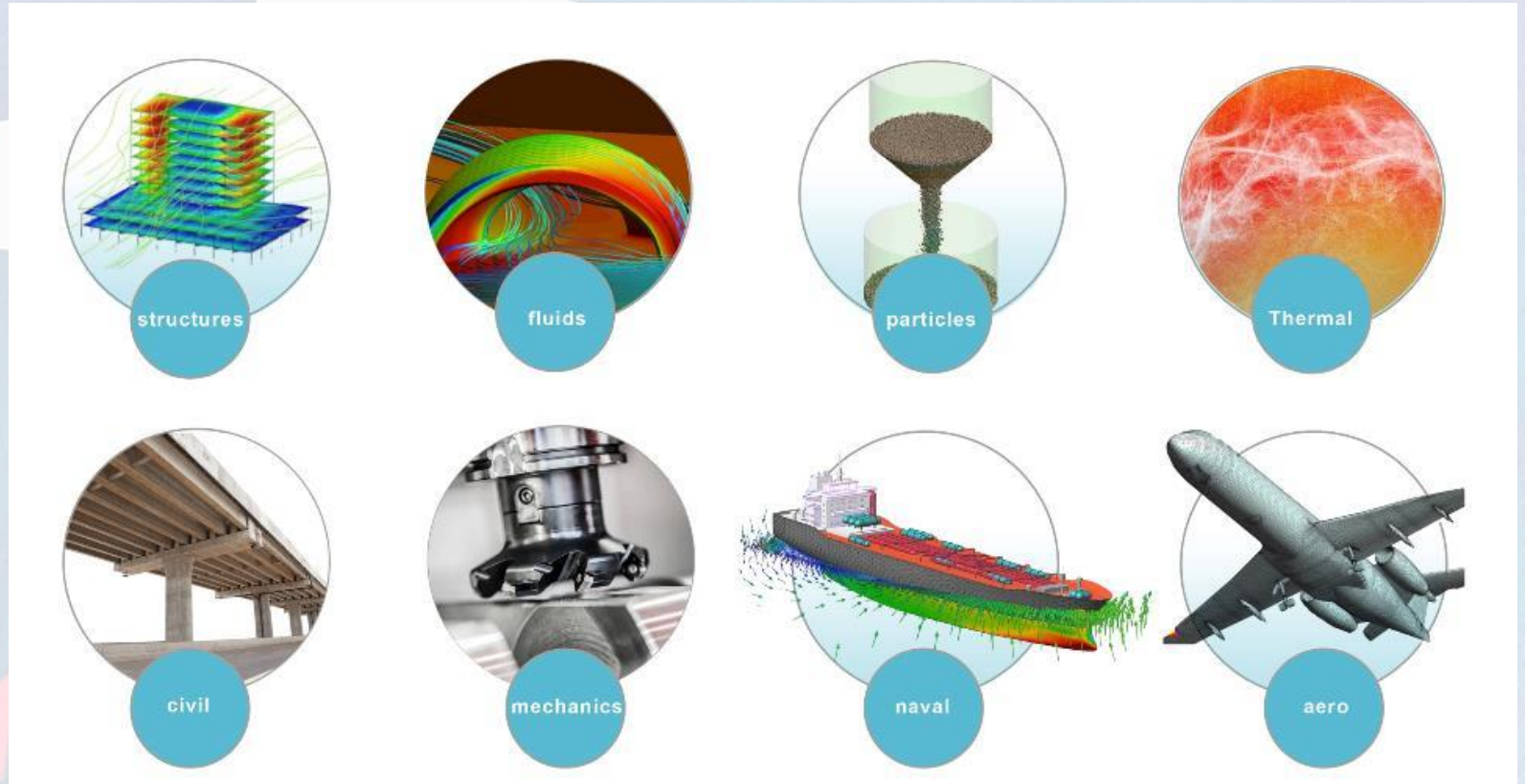
- Metamaterials
- Biomaterials
- Composite materials

## Mechanics and processes

- Solid mechanics
- Fluid mechanics
- Industrial processes

## Algorithms for large-scale scientific computing

- Data-driven methods
- Parallel computing algorithms (HPC)
- Real-time computing



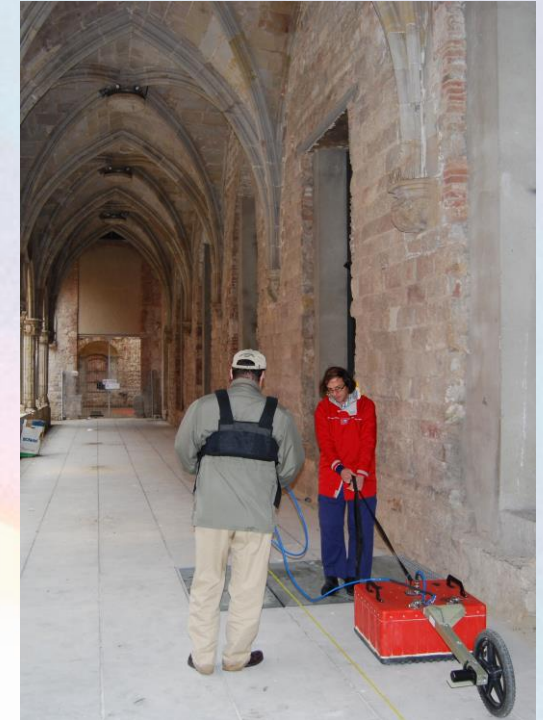
**Coordinator: Prof. Michele Chiumenti**

# PhD Program “Earthquake Engineering and Structural Dynamics”

## Topics addressed:

- **Seismic risk** at regional scale and at local scale (i.e., on cities, on nuclear power stations, etc.), including social aspects
  - **Soil – structure interaction** under seismic actions
  - Geotechnical Earthquake Engineering (slope stability, **tunneling**)
  - **Geo-radar and wave propagation** in soils, rocks and other materials
  - Dynamic behavior of **special structures** (tall buildings, wind turbines, ...).
- Monitoring and control applications**

**Coordinator:**  
**Prof. Alberto Ledesma**



- **Water and waste management**, treatment, characterisation and reuse
- **Integrated Coastal Zone Management**. Coastal Hydrodynamics and Morphodynamics. Port/ Coastal Engineering. Physical Oceanography.
- **Groundwater resource management**. Coastal hydrogeology. Hydro-bio-geochemical tools.
- **Energy and Bioenergy production**, management and optimisation, including decarbonisation, air quality and climate change
- **Resource recovery from waste** and wastewater streams (e.g. bio-based products, metals, bioenergy)
- Transition of **urban** systems towards **sustainability**. Climate-neutral, user-centric, energy efficient, circular and digitalised construction ecosystem
- **Noise** and vibrations induced by **infrastructure**. Environmental acoustics.
- Mathematical **modelling** of **bioprocesses** and processes digitalisation
- **Life Cycle Assessment (LCA)**, sustainability, circular economy



**Coordinator: Prof. Anna Garfí**

- **Geotechnical engineering**  
Coordinator: **Prof. Sebastià Olivella**



- **Civil Engineering**  
Coordinator: **Prof. Pavel Ryzhakov**



- **Marine sciences**  
Coordinator: **Prof. Cesar Mösso**



- **Sustainability**  
Coordinator: **Prof. Marti Rosas**



## Seguretat en inundacions urbanes

Las lluvias torrenciales en Nueva York inundan el metro y cancelan 1.200 vuelos

En Nueva Jersey se ha decretado el estado de emergencia y se han registrado numerosos cortes del suministro de luz



ió d'efluents agroalimentaris per a la  
gues i la seva aplicació en agricultura.  
2026.

onible de bioproductes a partir de  
xos de residus. Interreg SUDOE,

scentralitzades per a una gestió  
rizon Europe, 2025-2028.

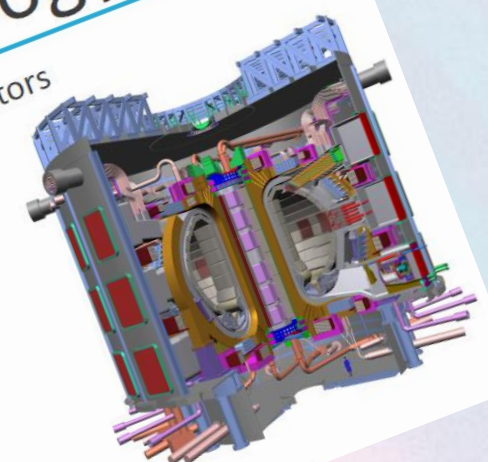
ls aiguamolls com a solucions  
la resiliència a la sequera  
9.

futur: reutilització d'air  
2028.



## Technology

fusion reactors

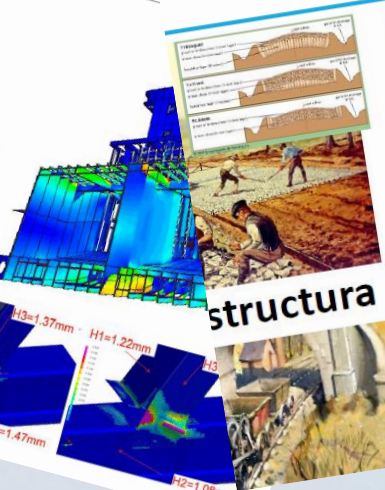
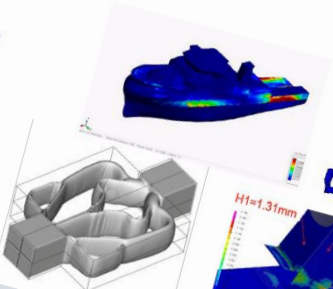


simulation methods  
ve engineering

## Achievements (1)

eria del Transport: via + vehicle + co

mechanics and dynamics:  
continuites for fracture  
element descriptions

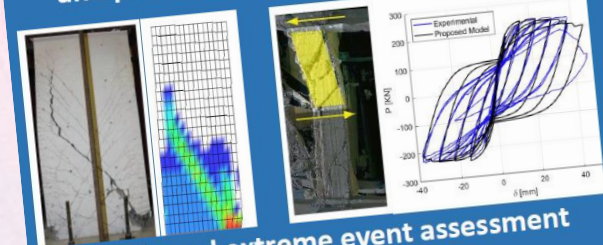


Vehicle

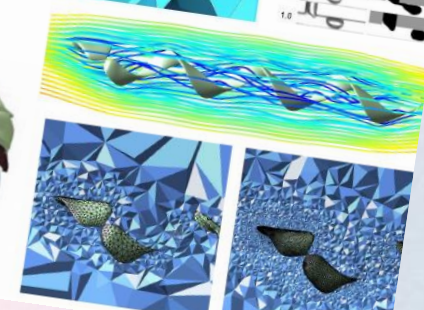
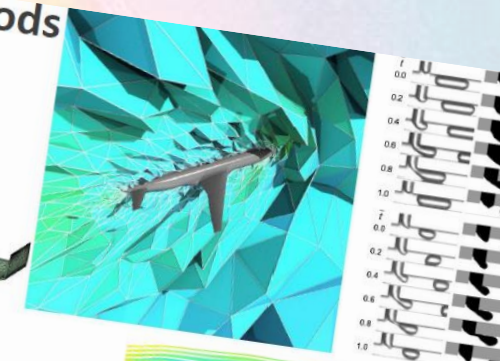


Data

Structural strengthening using textiles, FRP,  
and prestressed stainless-steel bands



Seismic and extreme event assessment  
and resilience



# Distinguished researchers, world references



Prof. Antonio  
Gens  
ca. 33000  
citations,  
h-index 85

Geotechnical  
engineering



Prof. Eduardo  
Alonso  
ca. 31000  
citations,  
h-index 79

Geotechnical  
engineering



Prof. Eugenio  
Oñate  
ca. 40000  
citations,  
h-index 92

Computational  
mechanics

## RESEARCH

# Distinguished researchers



Prof. Antonio  
Huerta  
16000,  
h-index 61

Numerical  
methods



Prof. Ivet  
Ferrer  
ca. 13000  
citations,  
h-index 62

Environmental  
engineering



Prof. Ramon  
Codina  
ca. 15000  
citations,  
h-index 64

Computational  
fluid dynamics



Prof. Anna  
Garfía  
ca. 7000  
citations,  
h-index 45

Environmental  
engineering

## RESEARCH

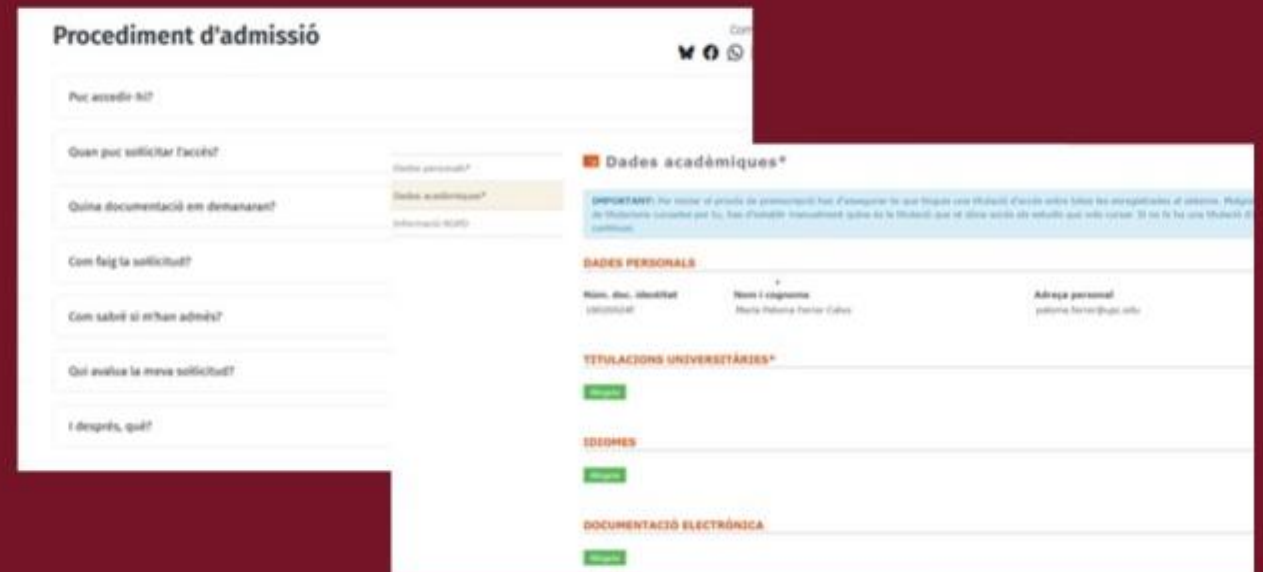
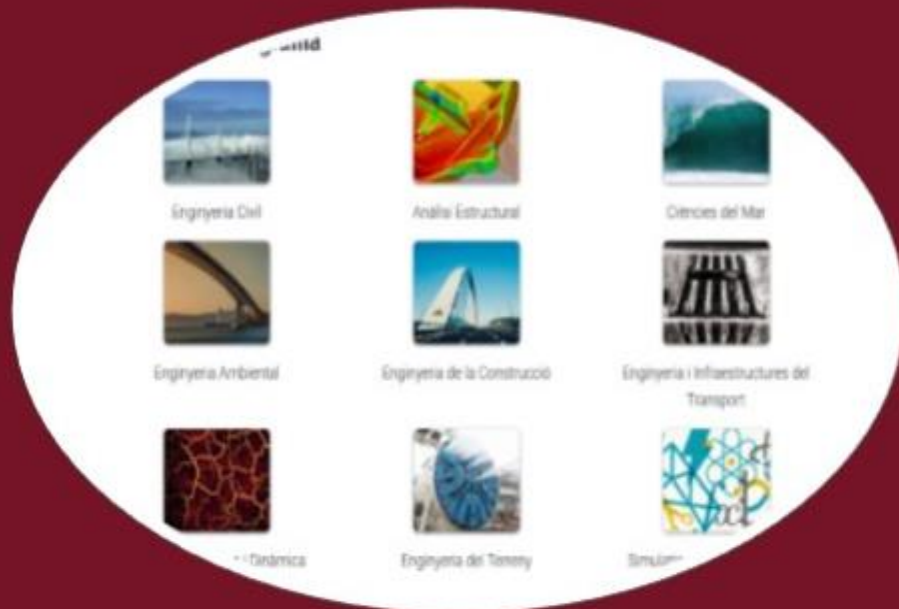
## How can I apply for a PhD?

1

Choose supervisor, see PhD programs, areas, topics of interest...

2

Upload your documents and apply on the Doctoral School's website



<https://deca.upc.edu/ca/doctorat-recerca/doctorat>

Scholarships: [Web recull convocatòries](#)

[https://camins.upc.edu/ca/recerca/doctorat\\_eng\\_civil/acces-admissio](https://camins.upc.edu/ca/recerca/doctorat_eng_civil/acces-admissio)



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## Cap de la Unitat - Head of Doctoral Support Unit

Civil Engineering

Structural Analysis

Marine Science

Doctoral Degrees

Geotechnical Engineering

Environmental Engineering

Sustainability

Construction Engineering

# Industrial doctorate option

The **School of Civil Engineering** was **Pilot Program** for **Industrial Doctorates** in 2013

We are the Division of the UPC with the **largest** **percentaje** of **Industrial Doctorates** ( **7 %** )





Escola de Camins



**THANK YOU FOR  
COMING,  
WE HOPE YOU JOIN US!**