

**Course announcement**  
**Coastal Engineering: Experimental and Numerical  
Modelling for Climate-Resilient Coastal Safety**

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**Universitat Politècnica de Catalunya - BarcelonaTech**



**10 hours - 2 cfu**  
**Classes will be in English**  
**Compulsory attendance**

**Final essay** based on a series of questions and exercises to obtain 2 cfu for PhD Students

**ABSTRACT**

Coastal regions are facing increasing challenges due to climate change. This short course aims to understand and address the complex interactions between natural forces, coastal structures, and climate-induced changes through experimental and numerical modelling in coastal engineering.

The workshop will provide attendees with expertise and knowledge on using wave flumes/basins to simulate and analyse wave-structure interactions. The focus will be on practical insights into coastal behaviour, with experimental observations dissecting overtopping - a critical aspect of coastal safety. This will provide a nuanced understanding of wave overwash and its implications for coastal structures.

The course includes a significant component dedicated to SPH modelling. Students will explore cutting-edge computational techniques for simulating coastal hydrodynamics. This approach enables a detailed examination of complex fluid dynamics, allowing for a sophisticated analysis of wave impacts on coastal structures.

In conclusion, this course provides a comprehensive exploration of experimental modelling, overtopping analysis, and SPH simulations within coastal engineering. By bridging theory

and practical applications, this course provides students with the skills and insights necessary to contribute to the development of climate-resilient coastal safety measures.

### OBJECTIVES

The students of the host institution will acquire new competences on:

- Numerical modelling of fluid-structure interaction problems, employing a meshless and open-source model, namely DualSPHysics, embedding a Graphical User Interface and ad-hoc post-processing tools.
- Coastal flood risk and wave overtopping.

✉ **Register by 22 March 2024** sending email to:

[tea.taraborelli@unich.it](mailto:tea.taraborelli@unich.it); [corrado.altomare@upc.edu](mailto:corrado.altomare@upc.edu) (in cc)

*For those not at University of Chieti-Pescara it is possible to follow the short course online: specify request when you register.*

TIMETABLE			
<b>TUESDAY</b>	2 <sup>nd</sup> April 2024	14.30	17.30
<b>WEDNESDAY</b>	3 <sup>rd</sup> April 2024	9.00	13.00
<b>WEDNESDAY</b>	3 <sup>rd</sup> April 2024	15.00	18.00