

WE-HPC

ICSC National Centre for HPC, Big Data, and Supercomputing WE-HPC – call 2025/26

Rationale

The increasing availability of computing power is driving the adoption of numerical simulations in Wind Engineering, a field traditionally reliant on wind tunnel tests conducted in specialized centres. However, applying Computational Fluid Dynamics (CFD) outside these centres requires a deep understanding of the reliability, applicability, and challenges associated with such analyses.

The **WE-HPC** course, "*High-Performance Computing: A New Challenge in Wind Engineering*," aims to provide essential theoretical and practical tools for the effective use of numerical simulations in bluff body aerodynamics and Wind Engineering, with a particular focus on High-Performance Computing (HPC) infrastructures.

The course is jointly organized by **ICSC** and the **Italian Association for Wind Engineering (ANIV)**, under the patronage of the **Department of Civil, Chemical, Environmental, and Materials Engineering at the University of Bologna**.

The programme

The course covers fundamental theoretical and practical aspects related to the use of CFD based simulations in the context of bluff body aerodynamics and Wind Engineering. The program is conceived in order to be self-contained, but previous knowledge of Structural Analysis and Numerical Methods applied to Partial Differential Equations is advised. The program is detailed in the table below.

WE-HPC					
Time	30 June	1 July	2 July	3 July	4 July
09:00		The numerical model	Numerical Schemes	Use of HPC facilities	Application 2
10:00		Physics of Turbulence			
11:00					
12:00	Registration	Lunch	Lunch	Lunch	Lunch
13:00	Introduction (13.30)				
14:30	Wind Engineering	Turbulence modelling	Grid generation and quality	Application 1	Optional visit to the HPC centre
15:30					
16:30	Bluff body aerodynamics	Inflow generation	Seminar 1	Seminar 2	
17:30					

Eligibility

The course is primary open to PhD students from any Engineering or Scientific discipline. The course is also open to master students and professionals, upon availability. A maximum of 20 students is accepted for the course, and selections are based on the Curriculum Vitae submitted with the application. For master students and professionals an interview, to be performed online, might be required by the Organizing Committee. For all students the course is free of charge, while professionals are required to contribute 800 € + VAT. Candidates living outside Italy may apply. Passive remote participation might be possible upon approval by the Organizing Committee (priority will be given to people attending in presence).

Call for application

Applicants must submit their application online at <https://agenda.supercomputing-icsc.it/e/WE-HPC>, including a Curriculum Vitae. The application starts on Monday 31st March 2025 and ends Sunday 1st June 2025 h 23:59. A maximum of twenty (20) attendees will be admitted to the course. Admissions will be processed in two stages. Those who submit their application before Sunday 13th April 2025 h 23:59 will receive confirmation no later than Thursday 17th April 2025. After this, applications will remain open until Sunday, 1st June 2025 h 23:59, and students will be admitted based on remaining availability.

Certificates

A Certificate of Attendance will be provided to all participants who attended at least 75% of the course hours (total 33 h, 25h to be attended). Exclusively for participants attending in presence, it will also be possible to independently develop, within 30 days starting from the end of the course, a report describing the application of the methodologies acquired during the course to the analysis of a particular case, to be agreed upon with the course Organizing Committee. Upon positive evaluation by the Organizing Committee, a Course Completion Certificate will be issued.