ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

OpenSource codes for the solution of differential equations in engineering applications

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Doctorate DIMSAI - AA 2025-2026

Summary

This seminar series, available to all PhD students at the University of Bologna, delves into solving differential equations using the finite volume method within the OpenFOAM environment. The primary applications focus on heat transfer, fluid dynamics, and various interdisciplinary fields.

The course is divided into four seminars, each comprising an initial phase of direct instruction followed by practical sessions, Q&A, and problem-solving with specific computational challenges

Contents of the seminars

- Introduction to the finite volume approach for the solution of differential equations
- TheOpen Source world for the solution of differential equations– Introduction to OpenFOAM
- Construction of computational domain and computational grid–Convergency check and validation
- Numerical solution by means of OpenFOAM–Application to simple examples

Time table

Date	Room	Title of the seminar
14/04/2026 15.00-18.00	Room A* and online	Introduction to the finite volume approach
21/04/2026 15.00-18.00	Room A* and online	The Open Source world for the solutionof differential equations
28/04/2026 15.00-18.00	Room A* and online	Construction of computational domain and computational grid
05/05/2025 15.00-18.00	Room A* and online	Numerical solution by means of OpenFOAM

Room A* : "Sala riunioni" at Fisica Tecnica Division, Industrial Engineering Department
Via Risorgimento, 2, Bologna – At first floor, at the end of the corridor

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Link for online lessons:

Microsoft Teams meeting
Join:
https://teams.microsoft.com/meet/362659386121 14?p=GdboR0yEUwqOMBCwqY
Meeting ID: 362 659 386 121 14
Passcode: YR7XP9eo

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Thank you!

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