Technical Courses
Cursos Técnicos

CFD with OpenFOAM online course

Online course. The content of the course is 50 hours, and the maximum time to complete it is 2 months. At the end of the course an aptitude certificate will be issued to the students.

CFD with OpenFOAM course includes manuals, videolessons and exercises. Our website has chat, forums, remote desktop connection, video conferencing, internal mail, etc. The teachers (M.I. Lamas and C.G. Rodriguez) have an extensive experience in CFD and OpenFOAM and papers in important international journals. Price: **400 €**

OpenFOAM is an open CFD (Computational Fluid Dynamics) software available for free at www.openfoam.org.

OpenFOAM community is growing fast and thus this software is becoming an important tool for both commercial companies and academics. OpenFOAM includes 80 solvers and more than 170 tutorials. They are useful to solve an extensive range of fluid flows, for instance the following ones:
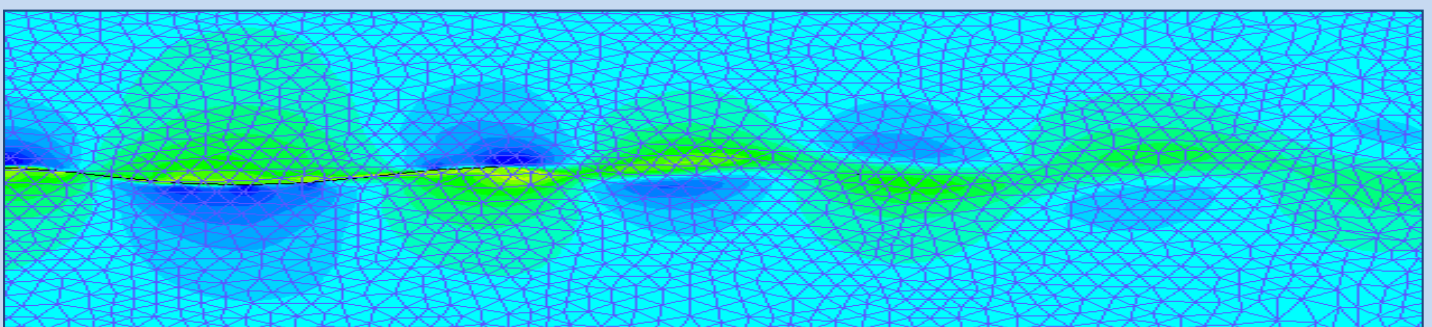
-Elemental computational fluid dynamics problems
-Compressible flows
-Chemical reactions
-Combustion
-Turbulence
-Heat transfer
-Engines and turbomachinery
-Solid dynamics
-Supersonic flows
-Electromagnetics
-Multiphase flows
-Etc

CFD with OpenFOAM
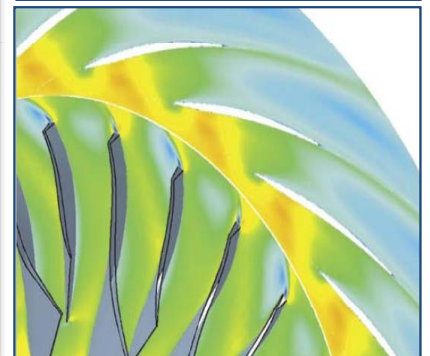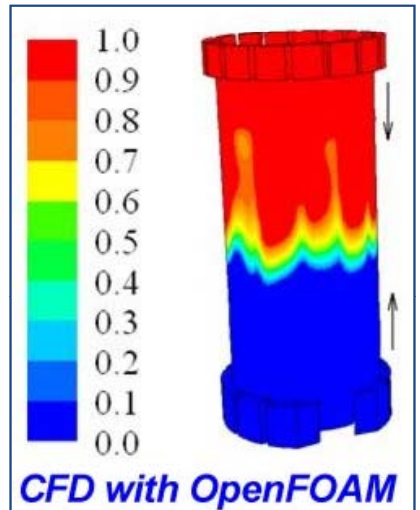
As OpenFOAM is an open software, it allows users to edit the source code. The code is written in C++.

Another advantage is that it can be run in parallel mode using multiple processors on a multiprocessor computer or on many computers across a network.

OpenFOAM also includes free meshing tools.

CFD with OpenFOAM online course

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Chapter 1: Computational Fluid Dynamics (CFD)
(This chapter includes a 33 pages text and a videolesson)
1.1 Introduction
1.2 Discretization process
    1.2.1 Spatial discretization of the domain
    1.2.2 Standard transport equation and equation discretization
1.3 Solution of discretized equations

Chapter 2: Introduction to OpenFOAM
(This chapter includes a 41 pages text and a videolesson)
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2.2 Installation of OpenFOAM under Linux, Windows and Mac OS
    2.2.1 Installation under Linux
    2.2.2 Installation under Windows and Mac OS
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Chapter 3: Postprocessing an OpenFOAM simulation
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Chapter 4: Mesh generation for OpenFOAM
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    6.2.3 Divergence schemes
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Chapter 8: Convergence in OpenFOAM
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10.2 Modification of a solver
10.3 Development of a new solver

Chapter 11: Additional resources
**(This chapter includes a 6 pages text and a videolesson)**
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11.2 CFD online forum
11.3 OpenFOAM manuals and OpenFOAM user guides
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OpenFOAM EXERCISES (BASIC LEVEL):
OpenFOAM exercise 1: Mesh creation (4 pages and a videolesson)
OpenFOAM exercise 2: Meshing a plate (9 pages and a videolesson)
OpenFOAM exercise 3: Conversion of Fluent format to OpenFOAM format (4 pages and a videolesson)
OpenFOAM exercise 4: Transient laminar flow in a duct (8 pages and a videolesson)
OpenFOAM exercise 5: Steady laminar flow in a duct (5 pages and a videolesson)
OpenFOAM exercise 6: Steady heating of a solid wall (5 pages and a videolesson)
OpenFOAM exercise 7: Development of an own solver. Steady heating of a solid wall with internal energy generation (8 pages and a videolesson)
OpenFOAM exercise 8: Development of an own solver. Transient level-set reinitialization (13 pages and a videolesson)

OpenFOAM EXERCISES (INTERMEDIATE LEVEL - OPTIONAL):
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OpenFOAM exercise 10: Oven (15 pages and a videolesson)
OpenFOAM exercise 11: Natural convection (18 pages and a videolesson)
OpenFOAM exercise 12: Combustion (19 pages and a videolesson)
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OpenFOAM exercise 14: Representation of residuals and forces (9 pages and a videolesson)
OpenFOAM exercise 15: Development of an own solver. Moving heat source (15 pages and a videolesson)
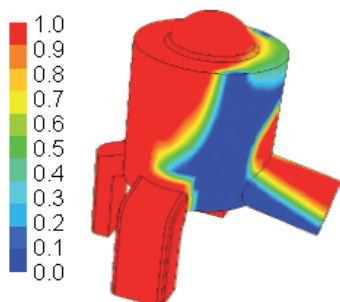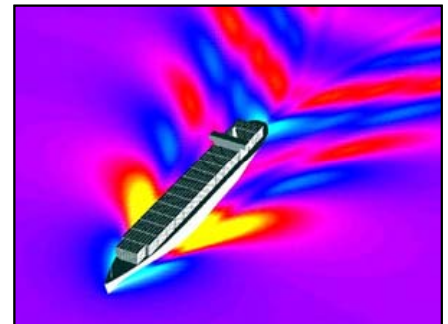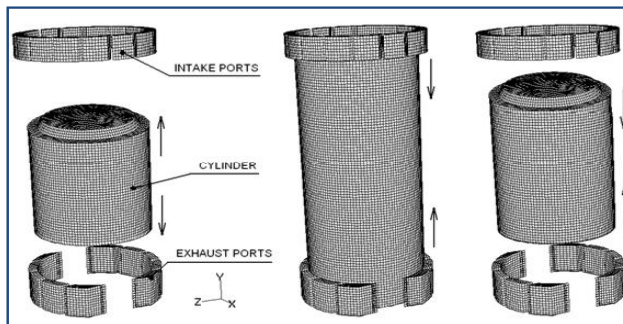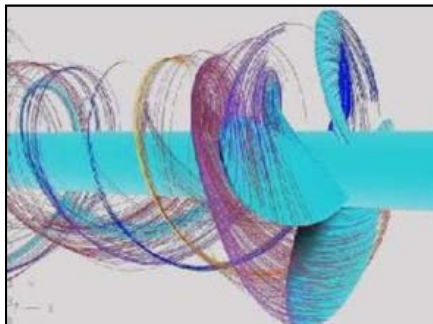
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