TRAINING PROGRAMME · INTER-COMPANY COURSE

code_saturne: thermo-hydraulics and heat transfer

CODE saturne

DATES	DURATION	FORMAT	LEVEL	PRICE
April 22 and 29, 2027	**2 days · 14 h**	**Remote · English**	**Advanced**	**€1,800 excl. VAT** Academic €800 excl. VAT

Audience

- **Industry:** engineers and technicians with basic knowledge of the physical and numerical field covered by the course.
- **Academia:** researchers, PhD students and students from higher education and research institutions.

Prerequisites

Command of code_saturne for simple studies, in-depth knowledge of fluid mechanics, solid CFD background and notions of thermo-hydraulics.

Practical arrangements

Maximum group size: 6 participants per trainer during practical work. Inter-company course.

Registration and access time

Registration through the online form on the session page, at least 30 days before the start of the session: https://simvia.tech/services/training/code-saturne-thermohydraulics-cfd-online-training_202704

Overview
(context, benefits)

Develop your expertise in code_saturne to model flows involving heat transfer and address industrial thermo-hydraulic challenges.

A resolutely hands-on course: practical work built on a review of the theoretical fundamentals, with exercises of increasing difficulty, from discovery to an industrial case.

The complete workflow: the tools of the simulation chain (Salomé, code_saturne, ParaView) are used together, as in a real study.

Practising trainers: our engineers and PhDs use these codes every day on industrial projects.

Close supervision: 1 trainer for a maximum of 6 trainees during practical work.

An inter-company format that encourages participants to share their experience with peers.

Objectives and targeted skills

Learning objectives, assessed during and at the end of the course. By the end of the course, participants will be able to:

- Set up a code_saturne thermal analysis in forced and natural convection.
- Select and compare turbulence and heat transport models.
- Customise a model with user files: heat sources, time-dependent boundary conditions.
- Simulate conjugate fluid-solid heat transfer with radiation and check the energy balance.

Course content

DAY 1 · THEORY **Foundations of thermo-hydraulics in CFD**

- Principles and physical couplings of thermo-hydraulic flows
- Modelling turbulent heat transport
- Thermal settings in code_saturne

DAY 1 · PRACTICALS **Forced and natural convection**

- Practical 1: turbulent heated channel, turbulence model comparison, ParaView profiles and fluxes
- Practical 2: differentially heated cavity, buoyancy, Boussinesq vs dilatable fluid

DAY 2 · THEORY **Customising and extending models**

- User files and the SRC directory structure
- Modify – compile – run cycle
- Practical 3: localised heat source and time-dependent boundary conditions

DAY 2 · PRACTICALS **Conjugate heat transfer and radiation**

- Practical 4: fluid–solid conjugate heat transfer (CHT), interface fluxes
- Practical 5: adding thermal radiation, radiative share of the energy balance
- Questions, discussion and wrap-up

Teaching methods

Remote course in a virtual classroom, in English.

Active teaching alternating theory and hands-on practical work on the participant's own computer, with exercises of increasing difficulty.

Resources: virtual classroom with screen sharing, course materials given to each participant, remote assistance from the trainer during practical work.

Pre-course call to understand participants' needs; end-of-day review (feedback and adjustments); immediate satisfaction survey at the end of the course.

Supervision

Simvia adapts each course to the actual needs of the trainees. Sessions rely on active teaching, with practical and personalised exercises that anchor learning in real time.

Theory sessions alternate with supervised practical work.

Equipment

Computer with an internet connection, microphone and speakers or headset; software installed before the session (installation help is provided).

Duration

Total duration: 2 days, i.e. 14 hours.
Schedule: 9:00 am – 12:30 pm and 1:30 pm – 5:00 pm.

Dates

April 22 and 29, 2027 (two days one week apart)

Location

Remote course in a virtual classroom, inter-company format. The connection link is sent with the joining instructions.

Price per participant	**Company:** €1,800 excl. VAT per participant. **Academic:** €800 excl. VAT per participant. **Included:** help with installing the latest version of the software, training completion certificate. French companies may have the course covered by their OPCO (French skills operator) under the skills development plan. Not eligible for CPF (French personal training account).
Accessibility	Simvia is committed to making its courses accessible to people with disabilities; our premises are accessible to people with reduced mobility. Our trainers adapt their teaching methods to each situation. For any specific need, please contact our disability officer: oumaima.nassif@simvia.tech.
Course manager, contact	**Teaching manager:** Florian Hermet, florian.hermet@simvia.tech **Administrative and disability officer:** Oumaima Nassif, oumaima.nassif@simvia.tech **General contact:** training@simvia.tech
Trainers	**Florian Hermet** PhD in fluid mechanics, senior CFD engineer Practising code_saturne trainer at Simvia, working daily on industrial projects. If unavailable, a trainer with equivalent expertise is appointed and confirmed in the joining instructions.
Attendance and certificate	Attendance sheet signed by trainees and trainer for each half-day. Training completion certificate issued upon passing the final assessment.
Assessment	Formative assessment at the end of day 1 (checking what has been learned that day). Summative assessment at the end of day 2 (validating learning across the whole course). Immediate satisfaction survey at the end of the course. Delayed assessment 2 months after the course, for the trainee and the company.
Going further	Simvia offers specialisation modules and a technical support service to deepen and extend skills development. Full catalogue: https://simvia.tech/services/training/catalog