

# MESHFREE – Beginners

Virtual Course

<https://www.meshfree.eu/en/events.html>



## Course Content

Lectures for all participants and practical exercises in small groups alternate. The following topics will be elaborated.

- Overview of MESHFREE (Who is behind it? Why no mesh? What can it do? How to access it?)
- Theory of MESHFREE (geometrical and mathematical modeling)
- Workflow of MESHFREE (preparation of surface mesh of geometry, setup of input files, execution of simulation, analysis of simulation results, trouble-shooting)
- Training setup: single-phase flow in a pipe
  - Exercise I – read-in of geometry including scaling, geometry alias for no-slip wall
  - Exercise II – geometry aliases for inflow and outflow, solver parameters and time control
  - Exercise III – general saving parameters and save items
  - Exercise IV – equations and curves, point cloud definition and alias variables
  - Exercise V – spherical point cloud refinement, radial point cloud refinement
  - Exercise VI – open outflow, half-filled pipe, free inflow
  - Exercise VII – movement of inflow
- Computational steering in MESHFREE (communication with running simulation)
- Material modeling in MESHFREE (surface tension, porous basis material, sophisticated equation of state, sophisticated viscosity, elastoplastic behavior, viscoelastic behavior)

## Technical Prerequisites

- Participants need a PC or laptop with (integrated) webcam as well as microphone and loudspeakers (a headset would be optimal).
- MESHFREE as well as ParaView have to be installed on the participants' PC or laptop. See <https://meshfree.pages.fraunhofer.de/docu/install> for details.

### **Video Conference Tool**

We will use MS Teams as means of communication. For this, we will create a team solely for this course that participants will be added to by mail address. Specific topics and questions can be discussed in separate channels if needed.

### **Course Language**

English

### **Course Instructor**

MESHFREE team (Fraunhofer ITWM)

### **Course Duration**

Two days of training and optional third day of supported self-study, each from 9:00 to 16:30.

*All times in UTC+2:00 from last Sunday in March to last Sunday in October, UTC+1:00 from last Sunday in October to last Sunday in March.*

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### **Registration**

Participation is limited. Please register bindingly via mail to [support@meshfree.eu](mailto:support@meshfree.eu) up to two weeks before the course date.

*Please note that export control must be carried out for non-German participants/organizations.*

### **Course Fees**

None

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*Keep up to date on the planning of future courses without obligation via the following mailing list  
To subscribe, send an email to [meshfree-training-interest-subscribe@itwm.fraunhofer.de](mailto:meshfree-training-interest-subscribe@itwm.fraunhofer.de)*