

From: Lars Davidson, CFD-Sweden, 14/07/2023

Subject: 3-day online course 'Large Eddy Simulation (LES), hybrid LES-RANS, Detached Eddy Simulation (DES) and unsteady RANS'

Date: 4, 6, 8 December 2023

Details: LES is suitable for bluff-body flows or flows at low Reynolds numbers. To extend LES to cover industrial flows at high Reynolds numbers, new approaches (hybrid LES-RANS, DES, URANS, SAS, PANS, PITM) must be used. They are all based on a mix of LES and RANS. The course will give an introduction to LES and these new methods.

On Day 3, an introduction will be given on how to use Machine Learning for improving underlying RANS turbulence models.

LES, or any of the new approaches, is the first step when performing accurate CAA (Computational Aero-Acoustics). The lectures will be given on-line (Live) using Zoom <https://www.zoom.us>. During the workshops, the participants will get supervision in a joint Zoom room which will enable participants to learn from each other's questions. Part of the supervision may also be given in individual break-out Zoom rooms.

Lectures will be given in the mornings; in the afternoons there will be workshops using Python (recommended), Matlab or Octave. The participants must have a PC/Mac/Desktop with one of these software packages installed. In the workshops, the participants will use Python/Matlab/Octave for analyzing SGS models, SAS, PANS, DES and DDES. Scripts will be used for generating isotropic and anisotropic (non-isotropic) synthetic turbulent fluctuations for inlet boundary conditions and embedded LES.

In the last workshop, the participants will use Machine Learning tools (SVR, kNN, pytorch) for improving turbulence models.

The number of participants is limited to 16.

The course fee is 14700 SEK.

For more information, see <http://www.cfd-sweden.se/>.