General instructions for the CFD Projects

Problem formulation.

- A web search
- Flow model
- Boundary and initial conditions
- Discretization scheme in space and time
- Grid requirements and choice of grid resolution
- Code specifics
- How to verify the computed results

CFD analysis

- Construct a mesh according to the requirement
- Run first computations, check if reasonable, be prepared to redo the computations several times
- Analyse the results, sources of errors
- Reconsider the choice of mesh, model and method.
- Perform a parameter study for different grids, models or methods

Quality

Present how you have demonstrated the quality:

- Iteration convergence
  - Residuals and forces
- Grid convergence
  - Compare solution on different grid refinements
- Wall grid y+ size
  - Estimate
  - Verify
  - Consequences on choice of wall treatment
- Numerics
  - First order upwind for momentum is not good enough

Good quality = knowing the errors

Presentation

Report and presentation should contain

- Problem formulation. Definition and parameters
- Computational domain and boundary conditions (fig)
- Grid topology and size (fig, zoomed fig)
- Results (fig of different properties)
- Quality (how quality is checked) (figs)
- Results quantified (figs)
- Results of parameter study (figs)
- Conclusions
- Lessons learned

Project workshop

- Tue 17 May, 13:15 – 17:00
- 10 min/project 7 min presentation + questions
- All group members should stand in front.
- All group members should be prepared to answer all questions

- Report to be handed in (one paper copy + digital)
- Upload report and presentation on Bilda before 11:00
- Presentation on memory stick as backup (PowerPoint or pdf)

No e-mail with report or presentation!!!

Grading

- Based on report and presentation – no individual
- Grade ”B” requires
  - Good quality of setup, model choice, mesh and computations
  - Good study (parameter, optimization, model, ...)
- Grade ”A” – additional value