ChE 330 – Fluid mechanics and transport phenomena *Autumn 2024* (4 credits)

Professor : Kevin SIVULA (kevin.sivula@epfl.ch)

Teaching assistant : Melanie JOHANNING (melanie.johanning@epfl.ch)

Time and place : Thursday 8h15 to 10h00 (lecture) and Thursday 10h15 to 12h00 (exercises) in **BC 04**

Evaluation (during the course) : One written midterm and one written final exam during the semester (both are « open book , open notes »)

- Midterm : Thursday **31st October**, 10h15 to 12h00 (**AAC 137***)
- Final exam (comprehensive) : Thursday **19th December**, 10h15 to 12h00 (**AAC 137***)

*Please note the different location for the Midterm and Final

Course schedule and information

Module 1 : "Shell" balances (deriving differential balances in continuum mechanics)

Module 2 : Generalized differential balances and the Navier-Stokes equation

Module 3 : Dimensional analysis and Ideal cases of the Navier-stokes equations

Module 4 : Differential balances for heat and material transport

Module 5 : Interfacial transport at a fluid-solid interface in laminar flow

Module 6 : Drag coefficient, Nusselt (and Sherwood) number correlations

Module 7 : Differential heat balances with interfacial transfer coefficients and "lumped" parameter methods.

Module 8 : Interfacial material transport coefficients, and combined heat and mass transfer in evaporation

Supporting material (suggestions): BSL « Transport Phenomena », Deen « Analysis of Transport Phenomena », and Geankoplis « Transport Processes and Unit Operations »

Moodle : All module notes (PDF format), exercise corrections, and additional practice material will be available on the course Moodle.

Final mark : 40% midterm + 60% final exam