EL513
Introduction to Computational Fluid Dynamics

- Module 1
  - CFD Fundamentals, Principles, Model set up procedures including Grid Considerations and requirements, Boundary Conditions types and the user input for each boundary type including flow through porous media
- Module 2
  - Physical properties of materials and the required user input, Turbulence modeling, solution control parameters and discretization schemes
- Module 3
  - Solution-adaptive mesh refinement
    - Case Study 1 - Fluid Flow and heat transfer in a mixing elbow;
  - Streamwise - periodic flows
    - Case Study 2 - Modeling periodic flow and heat transfer
- Module 4
  - Compressible Fluid Flow considerations
    - Case Study 3 - Modeling external compressible Flow
    - Case Study 4 - Modeling unsteady compressible flow
- Module 5
  - Heat transfer and radiation modeling
    - Case Study 5 - Modeling radiation and natural convection
- Module 6
  - Non-Conformal meshes
    - Case Study 6 - Using a Non-Conformal Mesh
    - Case Study 7, Modeling flow through porous media
  - Modeling flows with rotating reference frames
    - Case Study 8 Modeling flow through a rotating machine