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