Module 03: COMSOL

Focus: This module will basically help you to get introduced and trained with COMSOL along with some practical implications of either the studied part or some newer application like Flow problems at least in 2D or 3D perspectives.

NOTE: If you encounter any problem, please write on WHATSAPP Group, additionally we will have discussion regarding doubts of this module on Monday 10 PM (Link will be shared on WP group.)

COMSOL MULTIPHYSICS INSTALLATION
- Please install COMSOL Multiphysics using CC licence, Link for step to step guide: https://www.iitk.ac.in/nt/faq/comsol5.0.htm
- Reading OR Reference Materials:

☐ Get To Know Interface@COMSOL
1. Introduction to Comsol [~10 mins.] https://youtu.be/N6ZE_NqCpK0

☐ Applications + Hands-on Practice Problem:
2. Laminar, single-phase fluids flow around different shapes [Steady state].
    a. Illustration video for flow around circular geometry. https://www.youtube.com/watch?v=fPDPxSs-OpY
    b. **[Assignment 3.A]** Submit a short report **not exceeding 3 pages**, explaining the influence of various geometry (Circle, Rectangle, Triangle] around the flow. With some plots or figures whatever you learnt from Section 2.a. Play with the coloured plots of velocity profiles generated, try to visualise the streamlines and get an idea about how to use COMSOL for simulation.
    [To be submitted by **May 20th, 2022**]
3. Heat transfer Simulations Using COMSOL (Continuation of Module 01)
    a. Heat Transfer using Cylindrical Fins Installation (Watch with patience and follow end-to-end procedure). https://www.youtube.com/watch?v=FnccYllBRkw&t=1s
    Learning Objective:
    - Creating Extended 3D geometries
    - Steady State Simulation
    - Parametric Sweeping Idea
    - Usage of Boundary Conditions
    - Creating 3D Coloured Plots/ Rainbow Plot for better understanding (3D)
    - Creating 1D plots for the parameters we are concerned about.
    b. **[Assignment 3.B]** Submit a short report **not exceeding 3 pages**, to demonstrate the understanding based on recommended video. Report must contain the Model buildup, 3D coloured plots, rainbow plots, 1D plots for concerned parameters, Parametric Sweep plots, along with listings of boundary conditions you implemented and exact procedures starting from construction of geometry to final simulation.
    [To be submitted by **May 20th, 2022**]

Submission Guidelines:
- Submissions of the Report should be named in the format defined as Name_ChEA_PMD_3(A/B). [Limit both reports to 3 pages only]
- Email the reports in pdf format @ Chemineers01@gmail.com with a cc to sunnyecell1001@gmail.com