

CP502 Computational Fluid Dynamics (CFD) Project Guidelines

- prepared on 20 June 2019

- CFD projects shall be carried out on individual basis while discussing the project with others is much encouraged.

- **Intended Learning Outcome (ILO) of CFD project is as follows:**

Demonstrate the ability to self-learn and analyse incompressible viscous, non-isothermal, non-Newtonian flow of a complex flow system using MATLAB/COMSOL software

- **CFD project execution:**

Read the journal publication(s) provided as Suggested CFD Project(s) at the URL: http://rshanthini.com/lecturing_on/cp502. You are expected to read and understand the equations describing the physical system(s) given in the publication(s). You are not expected to solve the equations by analytical methods. Solve the equations using COMSOL/MATLAB. Compare your numerical solutions with the results provided in the publication.

You may also base your CFD project on physical systems discussed in a journal publication of your own choice PROVIDED you discuss the said publication with me and get my permission to do so.

- **CFD project report compilation:**

Please compose a CFD project report containing the following sections: Engineering Knowledge; Investigation; Modern Tool Usage.

Under Engineering Knowledge section, demonstrate your understanding of the first principles and logical reasoning underlying the mathematical models (governing equations, boundary conditions and any other empirical equations used). This section is assigned a maximum of 05 marks.

Under Modern Tool Usage section, describe in detail how you translated the mathematical models into a simulation software and how you generated numerical results by selection of appropriate solution procedure. This section is assigned a maximum of 10 marks.

Under Investigation section, describe in detail how you validated the results obtained by you in your simulations by comparing them to the results available in the publication considered. State the limitations of the mathematical model developed in describing the real system. This section is assigned a maximum of 10 marks.

Even though, it is out of scope at the CP502 CFD project assessment level, for curiosity's sake, you may also make an attempt to work at understanding the possibilities of obtaining analytical solutions to the mathematical model considered making simplified assumptions to the system considered. You could count on me for any assistance required.

Format of the report is entirely of your choice. Your writing should be short and snappy (that is, to the point) and factual. Sentences must be properly formed with no spelling mistakes. Word to word reproduction of material available elsewhere will disqualify you in the CFD project component.

If you wish to get a feedback from me on the draft copy of your CFD project report, you must handover the draft copy to me on or before 30 August 2019.

- **CFD project report submission:**

Finalised CFD project report must be submitted on or before the last Friday of the academic session (any delay would cost -5.0 marks per one week delay and -25 marks for more than one week delay).

A hardcopy of the CFD project report must be deposited in the letterbox of Prof. R. Shanthini AND a softcopy must be emailed to admin@rshanthini.com in *.pdf or *.doc (.docx) format with the subject of the email as **CP502 Project Report_registration number** (I may not open the email otherwise).

- **CFD project report assessment:**

A maximum of 25 marks are allocated for the CFD project component of CP502. All of it is allocated to the report, and its breakdown is provided under **CFD project report compilation**. Any form of plagiarism would make you lose all 25 marks allocated.

If there arise a necessity to assure fair assessment of your CFD project report, you shall be called upon for an interview by the panel.

If you need to clarify anything regarding the CFD project, please call at 071-5326835 or email to admin@rshanthini.com with the subject as '**CP502_registration number**'.

- prepared by Prof. R. Shanthini

Wish you the best and hope you will enjoy the learning process underlying the CFD project execution.