

MARKING CRITERIA AND STUDENT FEEDBACK

MODULE: Advanced Computational Methods CFD

ASSIGNMENT: CFD : Ahmed Body

STUDENT: Timothy Jones

DATE: 27/1/20

This section details the assessment criteria. The extent to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Common Assessment Criteria Applied	Marks available	Marks awarded	Percent Awarded
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions. (e.g. Background research into CFD techniques and models)			%
70-79%: Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied. <i>You have conducted a thorough review of supporting literature to support your understanding of the CFD process and application to automotive external aerodynamics. This has clearly informed your methodology</i> <i>Some good research of Ahmed reference body results and testing used to support your analysis.</i> <i>Citations to a range of relevant sources are embedded in introduction to support CFD knowledge. Sources used to inform initial domain size, you could have also used these to help with the other initial modelling decisions. Good to see comparison of your method with that from reference sources.</i>	10	7.5	75
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline. (e.g. Justification of initial mesh strategy, mesh refinements and geometry based on comparisons with wind tunnel data)			
70-79%: Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base. <i>You demonstrate a good understanding of the CFD process and have used this understanding to develop a valid initial mesh and mesh refinements.</i> <i>Some of the choices have been informed by the empirical results</i> <i>Good justification of initial domain size, you could have also justified your boundary condition choices. Intelligence used to refine areas for base case based on expected flow structures and justify prisms. Density box decisions based on initial results.</i>	25	17.5	70
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence (e.g. Analysis of results to help create a validated base case, evaluation of methods used, analysis of aerodynamic device)			
60-69%: Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations. <i>You have conducted some good analysis of your results. You have compared the results obtained to the empirical data and noted any differences - you could have investigated these discrepancies in more detail.</i> <i>Your have conducted some good mesh, domain, turbulence model studies which have informed your proposed methodology.</i> <i>Good domain study, but you should have shown domain independence rather than rely on agreement with experimental data at that stage (a bad domain and another bad modelling choice may give numbers in the right region for the wrong reasons). The Mesh study repeated results appear to be an error (you may not have updated the mesh correctly as it is extremely unlikely the results would be repeated to 10d.pl). Prism layer study is good. Your studies could have been presented as graphs to help indicate the relative impact of each test. Postprocessing could have also been used to illustrate the impacts of the simulation parameters on the flow distribution. It's a shame you didn't test your method on the 35 degree slant as this would have demonstrated how robust your proposal is for similar geometries.</i>	30	19.5	65
4. Practical Application and Deployment Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems. (e.g. Methodology, use of post processor, selection of component design parameters)			
60-69%: A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity. <i>You understand the cfd process and demonstrate some proficiency with the software</i> <i>You have used the basic functions in the post processor to visualise and present the important results to support your model development. Some of the more advanced features of the post processor could have been utilised to make the results clearer</i> <i>You have created a well defined simulation which produces excellent results. Your postprocessing is basic but has been used to show your results effectively. It would have been good to see the effects of the simulation parameters on the flow structures and distributions. Again the 35 degree case would have led you to question some of your modelling decisions.</i>	20	13	65
5. Skills for Professional Practice Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation. (e.g. Technical report writing and presentation.)			
70-79%: Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally. <i>A very professional document which has an excellent structure and is a coherent account of the investigation conducted.</i> <i>Technical report formatting and presentation is excellent.</i> <i>Generally a very well presented document. Tables should be numbered above, Navier-Stokes and Ahmed should be capitalised. Results of studies could have been presented in a clearer fashion so trends could be identified.</i>	15	10.5	70
Assignment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate) ☐ Up to one-week late ☐ Over one week late		
	68	%	