

Worcester Polytechnic Institute
Mechanical Engineering Department
ME 612 Computational Fluid Dynamics
Homework 5. Due May 3, 2010

Problem 17.

What are the main components of the k-epsilon turbulence model? Include how many equations do you need to solve (in addition to the mass and momentum conservation equations), what the new quantities that you must find are, and what is usually done at the wall? Limit the discussion to half a page or less.

Problem 18.

Propose a numerical scheme to solve for the unsteady flow over a rectangular cube in an unbounded domain. The Reynolds number is relatively low, 500-1000. Identify the key issues that must be addressed and propose a solution. Limit your discussion to one page. Do NOT write down the detailed finite difference equations, but state clearly what kind of spatial and temporal discretization you would use.

Problem 19.

Write a short proposal (a page or two) explaining how you will find the flow over a simplified car model, under normal driving conditions, using FLUENT. Identify the main steps, the critical issues, and the expected outcome.

Problem 20.

Give an estimate of the time it will take you to do this, as well as the computer resources needed. JUSTIFY!