# Computational Fluid Dynamics Lab

Student Name

Date

**Figure 1a.** Computational mesh used in the numerical simulation of flow over a NACA 0012 airfoil at an angle of attack of 0o and a chord Reynolds number of =1.5x105. (top) Entire domain. (bottom) Enlarged region near the airfoil.

[copy and paste your figure 1a here – there should be two plots positioned top and bottom]

**Figure 1b.** Convergence plots from the numerical simulation for an angle of attack of 12o. (left) Residuals of the velocities, continuity equation, and turbulence quantities as a function of iteration number. (middle) Value of the drag coefficient as a function of iteration number. (right) Value of the lift coefficient as a function of iteration number.

[copy and paste your figure 1b here – there should be three plots positioned side-by-side]

**Figure 1c.** Velocity contour plots from the numerical simulation for an angle of attack of 12o. The colorbar indicates velocity magnitude in m/s. (top) Entire domain. (bottom) Enlarged region near near the airfoil.

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**Figure 1d.** Pathline plot of the flow in the immediate vicinity of the airfoil for an angle of attack of 12o.

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**Figure 1e.** Pressure contour plot in the immediate vicinity of the airfoil for an angle of attack of 12o. The colorbar indicates pressure in Pa.

**Figure 1f.** Output from ANSYS-FLUENT showing the calculated values of the drag and lift coefficients of the airfoil, as well as the dimensional drag and lift forces in Newtons.

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[copy and paste your figure 1e here]

**Table 1g.** Table comparing the lift and drag coefficients from the numerical simulation with those obtained from experimental data.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| a (deg) |  | | |  | | |
| Simulation | Experiment | e (%) | Simulation | Experiment | e (%) |
| 5 |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |