

# MAE 136 Study Guide (Equations Manual)

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## 1 Aerodynamic Forces

Lift Coefficient:  $c_L = \frac{L}{(q_\infty * S)} = \frac{2L}{\rho_\infty V_\infty^2 * S}$

Drag Coefficient:  $c_D = \frac{D}{(q_\infty * S)} = \frac{2D}{\rho_\infty V_\infty^2 * S}$

Moment Coefficient:  $c_M = \frac{M}{(q_\infty * S)} = \frac{2M}{\rho_\infty V_\infty^2 * S}$

\*if the above coefficients are per unit span, the S gets replaced with c. In addition to the above, there are two force coefficients:

Pressure Coefficient:  $C_p = \frac{p - p_\infty}{q_\infty}$

Skin Friction Coefficient:  $C_f = \frac{\tau}{q_\infty}$