Chapters 1, 2, 3 (Wallace & Hobbs)

## Some Equations

$p = \rho R T$

$pV = nR^{*} T$

$p = \rho R_d T_v$

$e = \rho_v R_v T$

$dq = dw + du$

$p_{sfc} = \int_0^{\infty} (g\rho) dz$

$\theta = T\left(p_o / p\right)^{R/C_p}$

$Z_2 - Z_1 = \left(\frac{R_d}{g_o}\right) \int_{p_2}^{p_1} T_v \frac{dp}{p}$

$[T] = \frac{1}{2\pi} \int_0^{2\pi} T \, d\lambda$

$\frac{dp}{dz} = -\rho g = -\frac{pg}{R_d T_v}$

$e = p\left(\frac{w}{\varepsilon + w}\right)$

$w_s = \varepsilon\left(\frac{e_s}{p - e_s}\right)$

$dq = c_v dT + p d\alpha$

$dq = c_p dT - \alpha dp$

$T_v = \frac{T}{1 - \left(e/p\right)(1 - \varepsilon)}$

## Some Constants

$R_d = 287$ J deg$^{-1}$ kg$^{-1}$

$R_v = 461$ J deg$^{-1}$ kg$^{-1}$

$R^{*} = 8.3143 \times 10^{+3}$ J deg$^{-1}$ kmol$^{-1}$

$\varepsilon = 0.622$

$\Gamma_d = 9.8 \times 10^{-3}$ deg m$^{-1}$

1 mb = 100 Pa

$g_o = 9.8$ m s$^{-2}$

$R/c_p = 0.286$

$c_p = 1004$ J deg$^{-1}$ kg$^{-1}$ (dry air)

$c_v = 717$ J deg$^{-1}$ kg$^{-1}$ (dry air)