

Read chapter 4 ( pages and 129-173).

1. 3.3,
2. 3.5,
3. 3.7
4. 3.8
5. 3.12 (long and tedious, but a good learning experience, start early on this one).
6. 3.14
7. Starting from the matrix equation (derived in class)

$$\begin{bmatrix} \omega^2 \mu \epsilon_1 - \beta_y^2 - \beta_z^2 & \beta_x \beta_y & \beta_x \beta_z \\ \beta_y \beta_x & \omega^2 \mu \epsilon_2 - \beta_x^2 - \beta_z^2 & \beta_y \beta_z \\ \beta_z \beta_x & \beta_z \beta_y & \omega^2 \mu \epsilon_3 - \beta_x^2 - \beta_y^2 \end{bmatrix} \begin{bmatrix} E_x \\ E_y \\ E_z \end{bmatrix} = 0$$

derive the express for the Fresnel's equation of wave normals:

$$\frac{s_x^2}{n^2 - n_1^2} + \frac{s_y^2}{n^2 - n_2^2} + \frac{s_z^2}{n - n_3^2} = \frac{1}{n^2}$$