Physics 2321. Light and Optics material

Chapters covered in last third of class: (14), 15, 16, (31), 32, 33.

Sections skipped or de-emphasized:

- No problems assigned for Ch. 14 or 31, but some of that material was still mentioned in lectures.
- Ch. 32.8 and 32.10 (except flat refractive surfaces) are not required.
- Ch. 33.3, 33.5, 33.8-on were skipped.
- I probably won't ask a question on Ch. 33.4.

Equations for Final.

Ch.31 Maxwell's Equations:

31-6a $\oint \vec{E} \cdot d\vec{A} = \frac{q}{\epsilon_0}$

31-6b $\oint \vec{B} \cdot d\vec{A} = 0$

31-6c $\oint \vec{E} \cdot d\vec{s} = -\frac{d\Phi_B}{dt}$

31-6d $\oint \vec{B} \cdot d\vec{s} = \mu_0 I + \epsilon_0 \mu_0 \frac{d\Phi_E}{dt}$

31p.909 Speed of light: $c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$

Golden rule $c = \lambda f$

32p.927 Law of reflection: $\theta_i = \theta_r$

32-1 Radius of curvature: $R = 2f$

32-2 Mirror equation (spherical mirrors): $\boldsymbol{\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f} = \frac{2}{R}}$

page 935 Sign conventions for spherical mirrors

32-3 Magnification: $M \equiv \frac{h'}{h}$

32-3 Magnification for mirrors (and lenses): $M = -\frac{d_i}{d_o}$

32-4 Index of refraction: $n = \frac{c}{v}$

32-5 Snell's law: $\boldsymbol{n_1 \sin \theta_1 = n_2 \sin \theta_2}$

32-6 Wavelength in medium with index of refraction n: $\boldsymbol{\lambda_n = \frac{\lambda}{n}}$

32-7 Critical angle for total internal reflection: $\sin \theta_c = \frac{n_2}{n_1}$ (for $n_1 > n_2$)

33-2 Thin lens equation: $\boldsymbol{\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}}$

33-4 Skip Lens-makers equation: $\boldsymbol{\frac{1}{f} = (n-1)(\frac{1}{r_1} + \frac{1}{r_2})}$

page 963 Sign conventions for thin lenses
