OPTICS SYLLABUS

Reading from Hecht	Topics
1.1 - 1.5	Introduction, light waves and photons
4.1 - 4.2	Rayleigh scattering
4.3 - 4.4.1	Reflection and refraction
4.4.1-2, 4.7 (but not 4.7.1)	More refraction and total internal reflection
4.5	Fermat's Principle, angular deviation though a prism
5.1 - 5.2.2	Refraction from a curved surface, congugate points
5.2.3 (1st part)	Thin lens image formation
5.2.3 (1st part)	More thin lens image formation
5.2.3 (2nd part)	Thin lens combinations
5.4.1 - 5.4.3	Image formation by mirrors
5.4.3	Spherical mirrors
5.5	Prisms
5.7.1 - 5.7.3	Optical systems - the eye, eyeglasses, and magnifiers
5.7.7	Optical systems - the telescope + MAGNIFIERS (next time)
6.1	Thick lenses, cardinal points
	Exam 1 (up to 5.7.7)
6.2	Ray tracing - matrix methods
	FALL BREAK
6.2, 6.3	More matrix methods, lens aberrations
6.3	More lens aberrations
2.1 - 2.3	1D wave equation, harmonic waves, and phase
2.5 - 2.10	3D waves
3.2, 3.3.1, 3.3.2, 3.3.4	Electromagnetic waves, energy and momentum
3.4.1, 3.4.2, 3.4.3,	Accelerating charges, synchrotron and dipole radiation
4.6.1, 4.6.2	The Fresnel Equations
4.6.3	Interpreting the Fresnel Equations
8.1.1 - 8.1.4	Linear, circular, and elliptical polarized light
8.2, 8.3, 8.4	Polarizers, dichroism, and birefringence
8.5, 8.6, 8.7	Polarization by scattering and reflection; retarders
7.1.1, 7.1.2, 7.1.3	Addition of waves of the same frequency, phasor addition
7.1.4, 7.2.1	Standing waves and beats
9.1, 9.2	Interference: general considerations and coherence
	Exam 2 (6.1 - 7.2.1)
9.3	Wavefront splitting interferometers, Young's slits
	THANKSGIVING BREAK
9.4.1	Amplitude splitting interferometers, double beam interference
9.4.1, 9.4.2 (first part)	More double beam interference, Michelson interferometer
10.1, 10.2.1	Diffraction and the single slit
10.2.1, 10.2.2	More single slit, double slit diffraction
10.2.3	Diffraction by many slits
10.2.4, 10.2.5, 10.2.8	2D diffraction apertures, diffraction grating