

Physics 108 Assignment#6 (due on 5/12/14)

Reading materials:

Pedrotti 3rd Edition: **Chapter 11:** 11-1 through 11-6

Chapter 12: 12-3, 12-4

Lecture Notes: pp. 54 - 67

Homework: (Pedrotti 3rd Edition)

- When a single slit with width d is obliquely illuminated by a collimated optical beam with wavelength λ_0 at incidence angle θ_{inc} , show that the outgoing electric field as a function of angle θ_{out} far from the slit is given by

$$E(\theta_{out}) = E_{inc} \cos\left(\frac{2\pi n}{\lambda_0} \rho - \omega t\right) \left(\frac{d}{\sqrt{\lambda_0 \rho}}\right) \left[\frac{\sin\left(\frac{\pi n d (\sin \theta_{out} - \sin \theta_{inc})}{\lambda_0}\right)}{\frac{\pi n d (\sin \theta_{out} - \sin \theta_{inc})}{\lambda_0}}\right]$$

- 11-15
- 11-20
- 12-4
- 12-6

Assignment#3 (Due 5/12/14):

- Landscape Lens:** Perform the Introductory Exercise on Landscape Lens using OSLOEDU software. Show YOUR results by (1) displaying the starting “Surface Data” and “Lens Drawing” for paraxial rays and non-paraxial rays; and (2) displaying your optimized “Surface Data” and “Lens Drawing” for paraxial rays and non-paraxial rays. (You may also try the following condition for start: and “draw off”).

SRF	RADIUS	THICKNESS	APERTURE RADIUS	GLASS	SPE
OBJ	--	1.6000e+03	582.352375	AIR	*
1	21.807957 V	4.000000	11.666830 S	BK7	C
2	27.777778	12.647480 V	9.997114 S	AIR	
AST	--	155.058604 S	4.341641 AS	AIR	*
IMS	--	--	67.000000		*

- 18-23 Use the lens specifications and OSLOEDU to (a) find the focal length of Proctor photographic lens and (b) find the ABCD matrix for such a lens.