Physics 108 Assignment#6 (due on 5/11/15)

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)

1. 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

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

2. 11-15

3. 11-20

4. 12-4

5. 12-6

Assignment#3 (**Due 5/11/15**):

11. ***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		*

12. 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.