Physics 1102 Experiment 3 Pre-Laboratory Assignment

Name_____ Instructor name _____

You must show and explain all work neat and organized to receive credit. Please show each step for calculations. YOU MUST TURN IN THIS SHEET to have your assignment graded.

1. (a) State the Huygens-Fresnel principle. (b) What device is used to collect the data in this experiment? (c) Plane waves are incident on a slit whose width is adjustable. The slit starts out one wavelength wide and increases to a width of 1000 wavelengths. Qualitatively describe the change in the diffraction pattern. (7 pts)

2. Light whose wavelength is $565\ nm$ is incident on a $0.00600\ mm$ wide slit. At what angle is the first diffraction minimum located? (5 pts)

3. In a computer-based experiment to study diffraction, the width of the central diffraction peak is $15.20\ mm$. The wavelength of the laser is $638\ nm$ ($1\ nm = 10^{-9}\ m$), and the distance from the screen containing the slits to the camera screen is $68.0\ cm$. Calculate the slit width. (8 pts)