## WAVE OPTICS: DOUBLE SLIT WS 4

1. At what angle is the first-order maximum for 450-nm wavelength blue light falling on double slits separated by 0.0500 mm?

2. What is the separation between two slits for which 610-nm orange light has its first maximum at an angle of 30.0°?

3. In a double slit experiment with monochromatic light, the separation between the slits is 2 mm. If the screen is moved by 100 mm toward the slits, the distance between the central bright line and the second bright line changes by  $32 \mu m$ . Calculate the wavelength of the light used for the experiment.

4. In a Young's double-slit experiment, the slit separation is doubled. To maintain the same fringe spacing on the screen, what must be the screen-to-slit distance *D*?

5. In Young's double slit experiment, the second order bright band of one light source overlaps the third order band of another light source. If the first light source has a wavelength of 660 nm, what is the wavelength of the second light source?

6. If one of the two slits in a Young's double-slit demonstration of the interference of light is covered with a thin filter that transmits only half the light intensity, describe what will occur.

7. A double slit is located a distance x from a screen as shown. Calculate the distance between fringes for 633-nm light falling on double slits separated by 0.0800 mm, located 3.00 m from a screen.

8. Using the result of the above problem, find the wavelength of light that produces fringes 7.50 mm apart on a screen 2.00 m from double slits separated by 0.120 mm.