

HW 3
ECE 410, Fiber Optics

Problem 1

- a) What is the maximum core radius allowed for a glass fiber having $n_{\text{core}}=1.465$ and $n_{\text{cladding}}=1.46$ if the waveguide is to support only LP_{01} mode at a wavelength of 1550 nm?
- b) How many modes would it support if the wavelength is changed to 980 nm?
- c) Calculate the numerical aperture (N.A) of the fiber

Problem 2

If a fiber has the following characteristics

$NA=0.1$, $a=5.93$ microns, $n_{\text{core}}-n_{\text{cladding}}=2.5 \times 10^{-3}$

Calculate the value of the wavelength in order to have a single mode fiber and the values of core and cladding refractive indices

