Javier Duarte, Department of Physics
University of California San Diego
Physics 2C, Winter 2020

Reading Assignment due Tuesday 2/18: Submit via Gradescope by 11:30am

1. An EM wave representing 650 nm laser light is traveling in the $+\hat{z}$ direction. At one point in space and time, the electric field is in the $+\hat{y}$ direction (i.e., the polarization of the wave is along the $\hat{y}$ direction). Assume that the amplitude of the electric field is 20.0 V/m.
   (a) At this same point in space and time, in what direction is the magnetic field pointing?
   (b) What is the magnitude of the magnetic field?
   (c) What is the magnitude of the average power per unit area of this wave?
   (d) Find an expression for the electric field of the wave $\boldsymbol{E}(z,t)$, assuming that the electric field at $z = 0$ and $t = 0$ is at maximum amplitude (in the $+\hat{y}$ direction). Note, the answer should be a vector. Give the numerical value of any constants introduced.
2. Unpolarized light of intensity I_0 is incident on two polarizers. Using Malus's Law, find the minimum and maximum possible values of the final intensity of the light after passing through the two polarizers.

For extra practice (not due): From Chapter 31 of Knight, 4th edition: Conceptual Questions: 6-8, 10. Exercises: 14, 16-18, 20, 22, 24-27.