**ECE 3030 Spring 2025 HW 2 Hints**

1. (a) & (b). Use the $1.6 \times 10^{-19}$ J/eV conversion to convert the minimum energy equal to the metal work function from eV to Joules. See Lecture 4, slide 4 to convert energy in Joules to photon wavelength. (c) As photon energy increases, it reaches electrons even deeper below the vacuum level. (d) Higher intensity means more photons but with the same energy.
2. See Lecture 4, slide 5 to convert (b) particle wavelength to momentum p and (a) use p to obtain kinetic energy.
3. Lecture 4, slide 8.
4. Lecture 5, slide 11.
5. Lecture 5, slide 16. General solution for $x>0$ is $\psi_2(x)= A_2 e^{jk_2x} + B_2e^{-jk_2x}$. But now $k_2$ is different than $k_1$.
6. Lecture 6, slide 6.
7. Lecture 6, slide 10.
8. Solve for thickness W.