Reading
1. Omar, Ch. 5 (Ch. 4 also used)
2. Handout 5: "Photonic crystals: semiconductors of light"

Problems
1. Omar (8) Ch. 4, Q. 5
2. Omar (8) Ch. 4, Q. 8
3. O Ch. 4, Q. 9
4. O Ch. 5, Q. 1
5. O Ch. 5, Q. 2
6. O Ch. 4, Pr. 10
7. O Ch. 5, Pr. 14
8. Kittel Pr. 6 (see below)

6. Square lattice. Consider a square lattice in two dimensions with the crystal potential

\[ U(x,y) = -4U \cos(\pi x/a) \cos(\pi y/a) \]

Apply the central equation to find approximately the energy gap at the corner point \((\pi/a, \pi/a)\) of the Brillouin zone. It will suffice to solve a \(2 \times 2\) determinantal equation.
9. Based on the information in Handout 5, please describe recent developments in the field of photonic crystals. Please use 24 sentences in your response.