
Physics of Semiconductors and Nanostructures
ECE 4070 / MSE 6050, Spring Semester 2019
Assignment 4

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Policy on assignments: Please turn them in by 5pm of the due date in the mailbox outside Phillips 426 marked for ECE 4070/ MSE 6050.

The due date for this assignment is **Friday, March 29th, 2019**.

General notes: Present your solutions *neatly*. Do not turn in rough unreadable worksheets - learn to **take pride in your presentation**. Show the relevant steps, so that partial points can be awarded. BOX your final answers. Draw figures wherever necessary. Please print out this question sheet and staple to the top of your homework. Write your name and email address on the cover.

Solve the following exercise problems from the course notes posted on the class website.

Problem 8.3 [1D DOS, Gaps, and Band Edge Effective Masses]

Problem 8.4 [Magnitudes of bandgaps and effective masses for the electron in a 1D crystal]

Problem 8.5 [Valence bands and hole conduction]

Problem 8.6 [Metals, Insulators or Semimetals]

Problem 8.7 [Periodicity of bands in the k-space, Bloch oscillations]

Problem 8.8 [Peierl's Distortion]