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Topics covered by the Solid State Physics lecture:

Semester 1:

1. Introduction to quantum mechanics part 1
2. Introduction to quantum mechanics part 2
3. Introduction to solid state physics
4. Crystals – chemical bonds
5. Crystallography
6. Bloch formalism, effective mass, density of states
7. Energy bands, forbidden gap
8. Fermi-Dirac statistics, Fermi level
9. Metals
10. Defects in semiconductors
11. Physics of p-n junction
12. Transistor
13. Vibrations in solids
14. Short introduction to physics of superconductors
15. Repetition of the material - exam

Semester 2:

1. Boltzmann equations, scattering mechanisms
2. Transport – description of semiconductor in electric field
3. Hall effect, magnetoresistance, thermoelectric force
4. Introduction to magnetism
5. Boltzmann equations – introduction to optics
6. Cyclotron frequency, plasma frequency
7. Optics, Einstein equations, lasers
8. Absorption
9. Radiative recombination processes
10. Nonradiative recombination processes
11. Excitons – free and bound
12. Role of defects in recombination processes
13. Crystal field model
14. Short introduction to low dimensional structures
15. Repetition of the material - exam