

PHY 631: Physics of Semiconductor Nanostructures

3-0-0-9

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Prerequisite:

Good understanding of quantum mechanics and condensed matter physics.

Course Content:

Review of condensed matter physics relevant to semiconductors, their electronic, optical properties; Characteristic length scale for quantum phenomena; Fabrication of semiconductor nanostructure; Heterostructure and band gap engineering; Transport in mesoscopic devices; quantum point contact; Magneto-transport: Interference effect in Aharonov-Bohm ring, Shubnikov-de Haas oscillations, Integer Quantum Hall effect; Coulomb blockade and quantum dot

Textbook:

There is no prescribed single textbook. However, the books that may be followed:

1. The Physics of Low-dimensional Semiconductors, John. H. Davies
2. Electronic Transport in Mesoscopic Systems, Supriyo Dutta

Research publications in the field.