NE-215 Aug. 3.0

Applied Solid State Physics

Instructor

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Teaching Assistant

none this year
Email: NA

Department: CeNSE

Course Time: 11.00 - 12.00, MWF

Lecture venue: MMCR, CeNSE Building

Page: No web page for the course, but class notes posted to the Course Google Group. Also posted are solutions to assignme

Announcements

Announcements concern only the scheduling of tests and cancellation of classes (if any).

Brief description of the course

The course is part of the core curriculum of the M.Tech degree program of CeNSE. It is also taken by a good fraction of the PhD students of CeNSE and by a few undergraduate (BS degree) students. The course intends to prepare students (esp. BTech graduates) for nano science/technology by introducing them to quantum mechanics, and to structure and properties of crystalline solids.

Prerequisites

None.

Syllabus

Review of Quantum Mechanics and solid state physics, Solution of Schrodinger equation for band structure, crystal potentials leading to crystal structure, reciprocal lattice, structure-property correlation, Crystal structures and defects, X-ray diffraction, lattice dynamics, Quantum mechanics and statistical mechanics, thermal properties, electrons in metals, semiconductors and insulators, magnetic properties, dielectric properties, confinement effects

Course outcomes

Basics of the following: quantum mechanics and relevance to solid state science and esp. to nanoscience; crystal structures and defects; electrical, thermal, and magnetic properties of solids; semiconductors and dielectrics

Grading policy

20% for assignments; 30 % for tests, 50% for the final.

Assignments

About 8 assignments during the semester

Resources

Recommended books and web sites are provided at the beginning of the semester; additions made during the semester as and when called for.