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**ME 281 (JAN) 3:0**

## **Thermodynamics of Crystalline Solids**

**Instructor(s):** Navaneetha Krishnan Ravichandran

**Course description:**

Pressure-volume and stress-strain variables, volume correction and wave propagation, the crystal potential and lattice dynamics, harmonic phonons, second quantization, renormalized and self-consistent phonon theory, anharmonic perturbation expansion - free energy, phonon frequency shift and width, band structure theory, adiabatic approximation, electron-phonon interaction and pseudopotential perturbation theory.

**Prerequisites:**

Good grasp of linear algebra and complex analysis preferred

**Resources:**

"Thermodynamics of Crystals" by Duane C. Wallace

**Outcomes:**

**Additional information:**

**Course website:**

<https://mecheng.iisc.ac.in/navaneeth/teaching.php>