Mineral physics I

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Mineral Physics Course

- Ultimate purpose of the Mineral Physics course
  - ✓To provide physical bases regarding physical properties of minerals from basic physics
- Mineral Physics I
  - ✓Summer semester
  - ✓Physical properties of minerals controlled by major chemical compositions and crystal structures
- Mineral Physics II
  - ✓Winter semester
  - ✓Physical properties of minerals controlled by crystalline defects
    - These properties can vary even with the same composition and structure

Course outline of Mineral Physics I

1. Thermodynamics
2. Elasticity
3. Lattice vibration
4. Equation of state
5. Shock compression
6. Thermal conductivity

Course outline of Mineral Physics II

1. Physical and mathematical background
2. Point defect
3. Defect chemistry of ferromagnesian minerals
4. Diffusion
5. Dislocation
6. Planar defects
7. Creep

Background requested to students

- Mathematics for freshmen in science courses
  - ✓Differential calculus
    - ◆Partial differentiation
  - ✓Integral calculus
    - ◆Integration by parts
    - ◆Ordinary differential equation
  - ✓Linear algebra
    - ◆Vectors and matrix
- Physics for freshmen in science course
  - ✓Classical mechanics
    - ◆Newton's law
    - ◆Potential
  - ✓Classical electromagnetics
    - ◆Ohm's law
    - ◆Maxwell's equations
  - ✓Thermodynamics