Lecture 4
Outline

Carrier Properties (Chapter 2.3)
- Charge
- Effective mass
  - \( m_\text{o}, m_\text{p} \)
  - Density of states effective mass
- Carrier concentration
  - Intrinsic semiconductor
  - \( n=p=n_i = 1\times10^{10}/\text{cm}^3 \) for Si at room temperature
- Doping
  - Donors, acceptors
  - Binding energy
  - Ionization energy
  - Donor/acceptor energy level
- N-type, p-type semiconductors
- Density of states
  - \( g_c(E), g_v(E) \)
- Fermi function
  - Fermi energy
  - Intrinsic Fermi level

Quiz #1
1 problem, 10 minutes

Reading: Chapter 2.3, 2.4

Homework #2: 2-1~2-6.
Due Wednesday 1/21.