

# PHYS 1444 – Section 003

## Lecture #16

Wednesday, Oct.  
26, 2005

Dr. Jaehoon Yu

- Charged Particle Path in Magnetic Field
- Torque on a Current Loop
- Magnetic Dipole Moment
- Potential Energy of Magnetic Dipole
- The Hall Effect
- Magnetic field due to a straight wire
- Magnetic force between two parallel wires



# Announcements

- Reading assignment
  - CH27 – 7
- The 2<sup>nd</sup> term exam
  - Date: Monday, Nov. 7
  - Time: 1 – 2:20pm
  - Location: SH 103
  - Coverage: CH 26 – whichever chapter we get to by Wednesday, Nov. 2



# Charged Particle's Path in Magnetic Field

- What shape do you think is the path of a charged particle in a plane perpendicular to a uniform magnetic field?
  - Circle!! Why?
  - An electron moving to right at the point P in the figure will be pulled downward
  - At a later time, the force is still perpendicular to the velocity
  - Since the force is always perpendicular to the velocity, the magnitude of the velocity is constant
  - The direction of the force follows the right-hand-rule and is perpendicular to the direction of the magnetic field
  - Thus, the electron moves on a circular path with a centripetal force  $F$ .

