

# Final Exam: Tuesday, May 9 at 7 pm

## Distribution of topics

About 1/3 – 1/5 on 1st half of semester  
About 2/3 – 4/5 on 2nd half of semester

## Electrostatics

Method of Images

Separation of variables, cartesian sym.

→ Orthogonality relation

Separation of variable, spherical sym.

→ Legendre polynomials

→ Orthogonality relation

Multipole expansion

Dipole moment

→ Forces on dipoles

Polarizability of matter & dielectrics

Bound charges (surface & volume)

Electric displacement  $D$

Linear dielectrics

capacitors

## Magnetostatics

Lorentz force law

Cyclotron motion

No magnetic work

Biot-Savart law

Ampere's law (and  $\text{div } B = 0$ )

→ Solenoid, toroid, surface current

Vector potential

Multipole expansion

Dipole moment

→ Forces on dipoles

Magnetization of matter

Bound currents (surface & volume)

Auxiliary Field  $H$

Linear magnetization

## Faraday's Law & Maxwell's Equations