TERMS
Be able to define or discuss the following terms with their SI units, if any.

1. Faraday's law
2. induced emf $\mathcal{E}$
3. induced current
4. Lenz's law
5. eddy currents
6. displacement current i_D
7. Maxwell's equations Eqs. (29.18, 29.19, 29.20, and 29.21)
8. mutual inductance M
9. self-inductance L
10. inductor
11. permeability μ

EQUATIONS
Understand the meaning and know the SI units of all the symbols in these equations—and be able to use the equations to solve problems.

1. Eq. (29.4)
2. $\mathcal{E} = v_\perp B_\perp l_\perp$
3. Eq. (29.10)
4. Eq. (29.14)
5. Eq. (30.4)
6. Eq. (30.5)
7. Eq. (30.6) (Thus, for two coils, $L_1 = \dfrac{N_1(\Phi_B)_1}{i_1}$ and $L_2 = \dfrac{N_2(\Phi_B)_2}{i_2}$.)
8. Eq. (30.7) (Thus, for two coils, $\mathcal{E}_{1,\text{self}} = -L_1\dfrac{di_1}{dt}$ and $\mathcal{E}_{2,\text{self}} = -L_2\dfrac{di_2}{dt}$.)
9. $U = \frac{1}{2}LI^2$
10. Eq. (30.11)

SKILLS
Use the material in these sections to be able to:
1. use Lenz's law to determine the directions of induced magnetic and electric fields, and the directions the resulting induced emfs will give to induced currents.
2. know that a magnet's external magnetic field is directed away from its N-pole and toward its S-pole.
3. understand the differences between the four average magnetic fluxes for two coils: the mutually-induced Φ_{B1}, the self-induced $(\Phi_B)_1$, the mutually-induced Φ_{B2}, and the self-induced $(\Phi_B)_2$.
4. distinguish between U (magnetic potential energy), u (energy density), and μ (permeability).
5. realize that $\mu \equiv \mu_0$ for vacuum and for nonmagnetic materials.
6. realize that μ is slightly greater than μ_0 for paramagnetic materials (if not at very low temperatures).
7. realize that μ is slightly less than μ_0 for ordinary diamagnetic materials (not superconducting).