Preparation Assignments

Due Wednesday, March 27

A magnetic potential is defined as:

$\vec{A} = \mu_o J_s \frac{r}{2} \hat{\phi}$ for $r < a$
$\vec{A} = \mu_o J_s \frac{a^2}{2r} \hat{\phi}$ for $r > a$

Detemine the magnetic field, $\vec{B}$ and the current density, $\vec{J}$ everywhere. What type of device would be associated with this potential distribution?

Due Thursday, March 28

For a two wire transmission line seperated by distance a, carrying current I_o, what is the total flux that passes through the surface between the wires (per unit length). What is the total flux that passes through the plane defined by the wires, excluding the section between the two wires?

Due Monday, April 1

A magnetic field line in air forms an angle of 15^o relative to the normal at the material-air boundary. For the three types of magnetic materials, sketch the field lines and indicate the angle relative to the normal on the material side of the boundary. Pick any material of that classification.

Due Wednesday, April 3

Sketch the surface you would use to apply Ampere's Law to a solenoid, a toroid, and a coaxial cable. Indicate $d\vec{S}$ for each geometry.