**Transformed E&M I materials**

**Magnetic Vector Potential**

**(Griffiths Chapter 5)**

**TIMELINE**

Prof A covers this in lectures 33,34.

Prof B. covers this in lecture 29.

Transformed course covered in lectures 34-36.

Dipole and multipoles in B (segue into Magnetization)

Prof A covers this in lectures 35-36

Prof B. covers this in lecture 30

Transformed course covered in lectures 36-37.

**LEARNING GOALS**

Magnetic vector potential

1. Students should be able to explain why the potential A is a vector for magnetostatics, whereas it’s a scalar (V) in electrostatics. Ie., that the source of magnetic fields (the current) is a vector, whereas the source of electric fields (charge) is not.
2. Students should recognize that A does not have a physical interpretation similar to V, but be able to identify when it is useful for solving problems.

**CLASS ACTIVITIES**

**Writing**

**What is A?**

Started with a writing exercise, basically "what is the A field, how is it used" (see my powerpoints for the wording) Gave ~3 minutes for that.

**Tutorial**

**Magnetic Vector Potential due to a Spinning Charged Ring” activity**

***Oregon State University***

Working in small groups students are asked to consider a ring with charge Q, and radius R rotating about its axis with period T and create an integral expression for the vector potential caused by this ring everywhere in space. Students also develop the power series expansion for the potential near the center or far from the ring.