

# Chapter-10

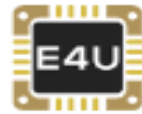
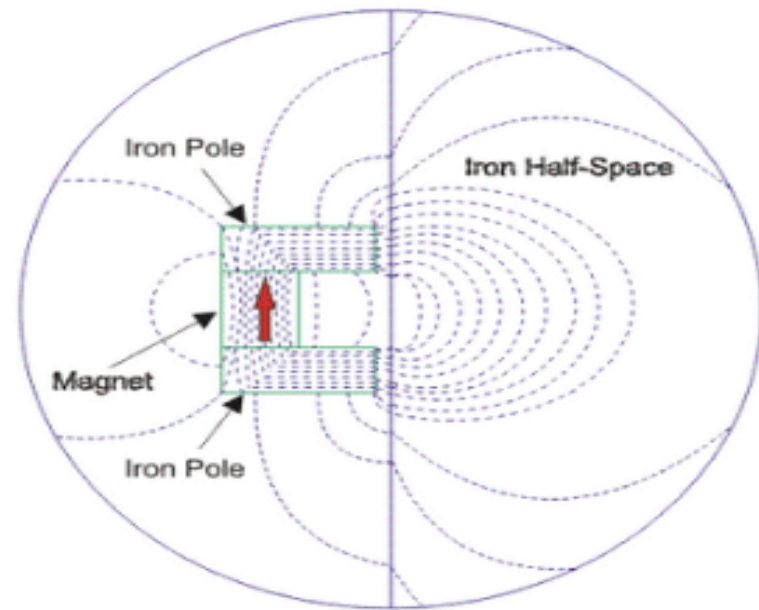
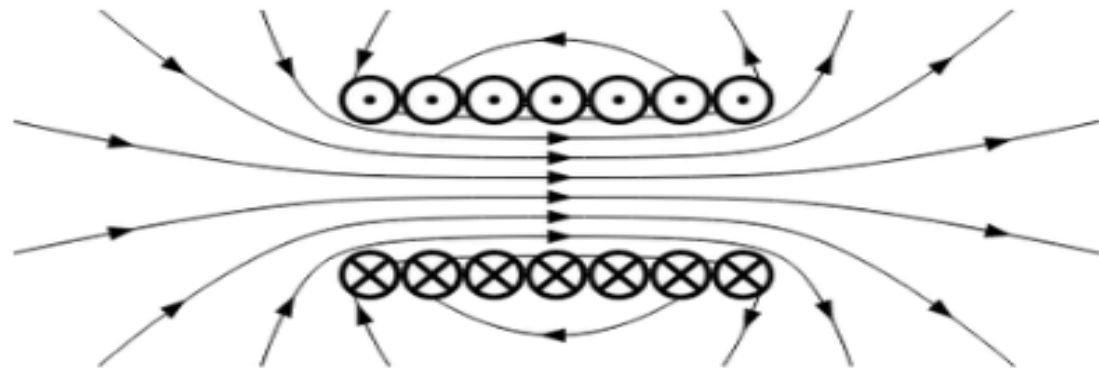
(Understand the concepts of energy-stored in a magnetic fields)

Lecture-1

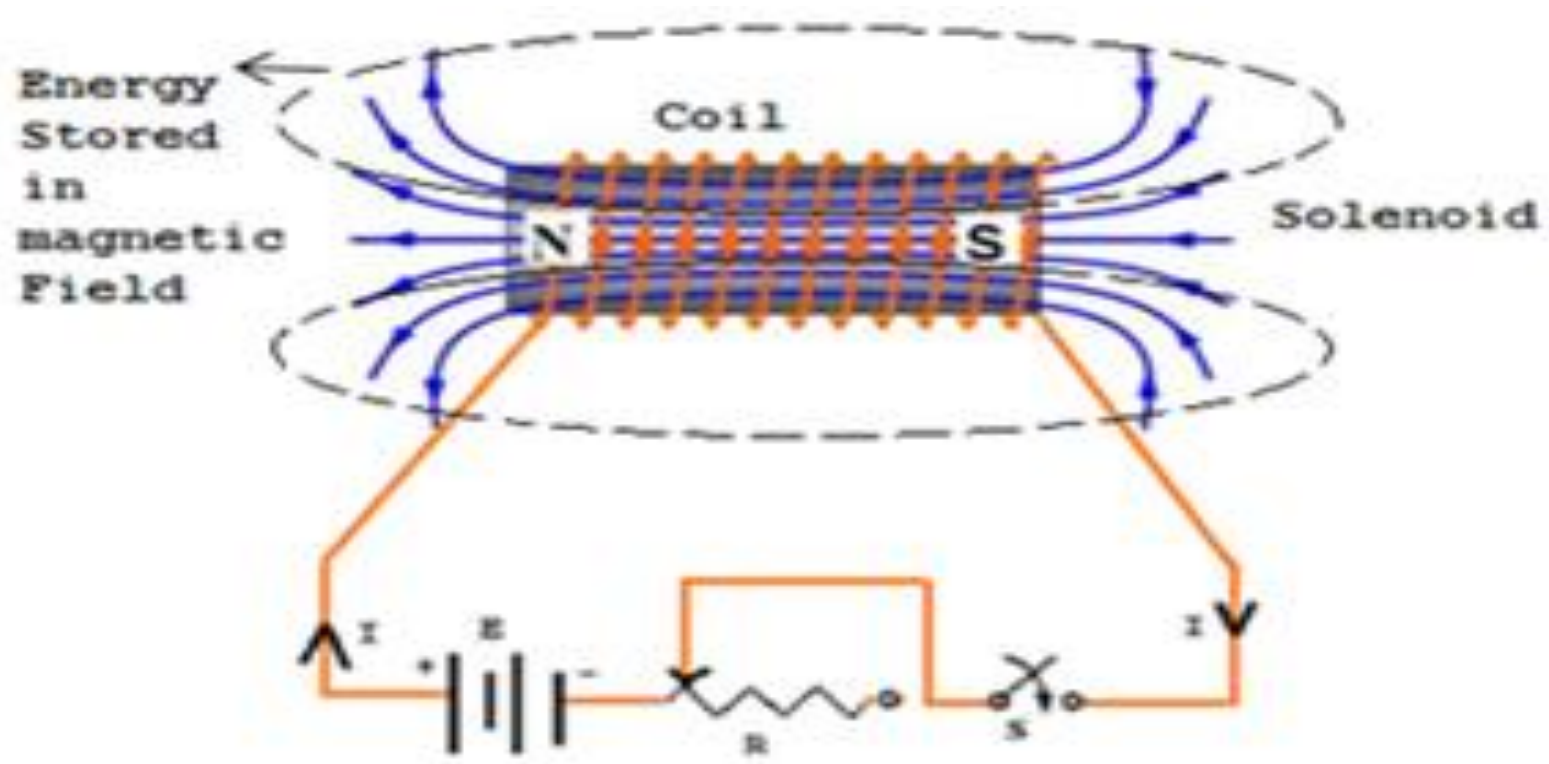
## The concepts of energy-stored in a magnetic fields?

- Magnetic field can be of permanent magnet or electro-magnet. Both magnetic fields store some energy. Permanent magnet always creates the magnetic flux and it does not vary upon the other external factors. But electromagnet creates its variable magnetic fields based on how much current it carries. The dimension of this electro-magnet is responsible to create the strength the magnetic field and hence the energy stored in this electromagnet.
- First we consider the magnetic field is due to electromagnet i.e. a coil of several no. turns. This coil or inductor is carrying current  $I$  when it is connected across a battery or voltage source through a switch.
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# What is the Energy Stored in a Magnetic Field?



**Electrical 4 U**



## **Energy stored in Magnetic Fields**

In a circuit for flowing current it takes a certain amount of energy to start a current.

That energy is equivalent to work must do against the back emf to get the current going.

This is a fixed amount, and it is recoverable: you get it back when the current is turned off.

It can be regarded as energy stored in the magnetic field.