**UNIT 8: ELECTRICITY AND MAGNETISM (30 Days)**

**A Current Theory**

Upon completion of this unit, the student should be able to:

1. Define static electricity and describe how it is produced.
2. State the basic law of electrostatics and contrast the two types of charges.
3. Explain the concept of an electric field and sketch the electric field lines around one or more charges.
4. Contrast a conductor and an insulator.
5. Describe and explain the processes of charging by conduction and induction.
6. Describe how a capacitor is built and the factors which affect capacitance.
7. Explain Coulomb’s Law and apply it to calculating the force between two electric charges.
8. Explain magnetism in terms of the domain theory.
9. Explain the difference among diamagnetism, paramagnetism, and ferromagnetism.
10. Explain the concept of a magnetic field, define magnetic flux, and sketch the lines of magnetic flux around a set of magnetic poles.
11. Explain the relationship between electricity and magnetism and describe applications which use this relationship, including motors and generators.
12. Explain superconductivity and the theory behind it.

Reference: Holt Physics (Serway/Faughn),Chapters 16 & 17 (electricity); chapter 19 (magnetism); chapter 20 (EM induction)

Homework: An Electricity problem sheet handout, a magnetic problem sheet handout.

Labs: It Can’t Work (homemade motor lab), Get a Charge (Static electricity lab)