

# Electromagnetism 3230 (2006)

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**Suggested literature:**

**David J. Griffiths “Introduction to Electrodynamics” (Prentice Hall)**

## I. Introduction

Applications of Electro-Dynamics (ED) include:

- Everyday life, engineering, electronics etc etc
- ED + quantum mechanics = QED. QED plays defining role in physical processes
  - Atoms
  - Molecules
  - Condensed matter

It also plays an important role in

- Nuclear and high-energy physics

QED is a gauge theory based on U(1) gauge symmetry. Gauge symmetry is very important. Other examples of gauge theories are the Weinberg-Salam theory of weak interactions based on SU(2) gauge symmetry and theory of strong interactions, Quantum Chromodynamics (QCD), which is based on SU(3).

$$\begin{aligned} \text{QED + Weak Interactions + QCD} = \\ \text{U(1) } \times \text{SU(2) } \times \text{SU(3)} = \end{aligned} \tag{1.1}$$

Standard Model