Program: BS(CS)-1st
Course Name: Applied Physics
Course Code: MT-302
Course Hours :   03
Total Weeks: 16
Total Hours: 48

Course Description

This course has been designed to provide an introduction to the ideas and concepts of Physics that would serve as a foundation for subsequent Computer Science courses. The primary objective is to endow the knowledge of a wide variety of electromagnetic phenomena's along with their scientific applications. The course initiates with a short review of relevant mathematics, immediately followed by the basics of electricity. A majority of the course is then dedicated for electric and magnetic fields, forces, elements and their applications. Additionally, it also aims to provide introductory knowledge of semi-conductor theory in conjunction with their applications.

Week-1
- Introduction to the course
- Electric Charge
- Properties of electric charge
- Quantization of charge
- Charge conservation

Week-2
- Coulomb's Law
- Permittivity of free space & Relative permittivity
- The Electric Field
- Properties of electric field lines

Week-3
- Introduction to Electric Dipole
- The flux of electric field
- Gauss's Law

Week-4
- Application of Gauss' Law
- Electric Potential Energy
- Electric Potential
- Potential Difference

Week-5
- Electric Potential in a Uniform Electric Field
- Electric current
- Conventional Current/Electron Flow

Week-6
- Alternating and Direct Current
- Current density
- Electrical Resistance
- Effect of Temperature on Resistance

Week-7
- Material and Shape Dependence of Resistance
- Resistivity and conductivity
- Ohm's law
- Applications of Ohm's Law

Week-8
- The Magnetic Field
- Magnetic Force Acting on a Current-Carrying Conductor
- Magnetic Flux
- Magnetic Flux Density

Week-9-10
- Insulators, Conductors, Semiconductors
- Types of Semi-Conductors
- Doping a Semiconductor
    - Intrinsic and Extrinsic Semiconductors
- Types of Extrinsic Semiconductors
    - (n-type, p-type)
- The unbiased Diode

Week-11
- Forward Bias
- Reverse Bias
- V-I characteristics curve of Diode

Week-12
- Applications of a PN Junction Diode
- Rectifiers
    - Half Wave Rectifier
    - Full Wave Rectifier

Week-13

- Clipper
- Limiter

- Clampers

Week-14
- DC Power Supply
- Unbiased Bipolar Junction Transistor

Week-15
- The Biased Bipolar Junction Transistor
- Transistor currents
  - Collector, Base, Emitter Currents

Week-16
- Presentations

Final Examination	:	70
Mid Term Examination	:	20
Quiz/Assignments/Presentations	:	10
Total Marks:	:	100 Marks

Recommended Books:
1. Fundamentals of Physics 10th Edition (Extended) by Halliday, Resnick,