



THE UNIVERSITY OF AGRICULTURE PESHAWAR
Institute of Computer Science and Information Technology

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
<u>Quiz/Assignments/Presentations</u>	<u>: 10</u>
Total Marks:	: 100 Marks

Recommended Books:

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