



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

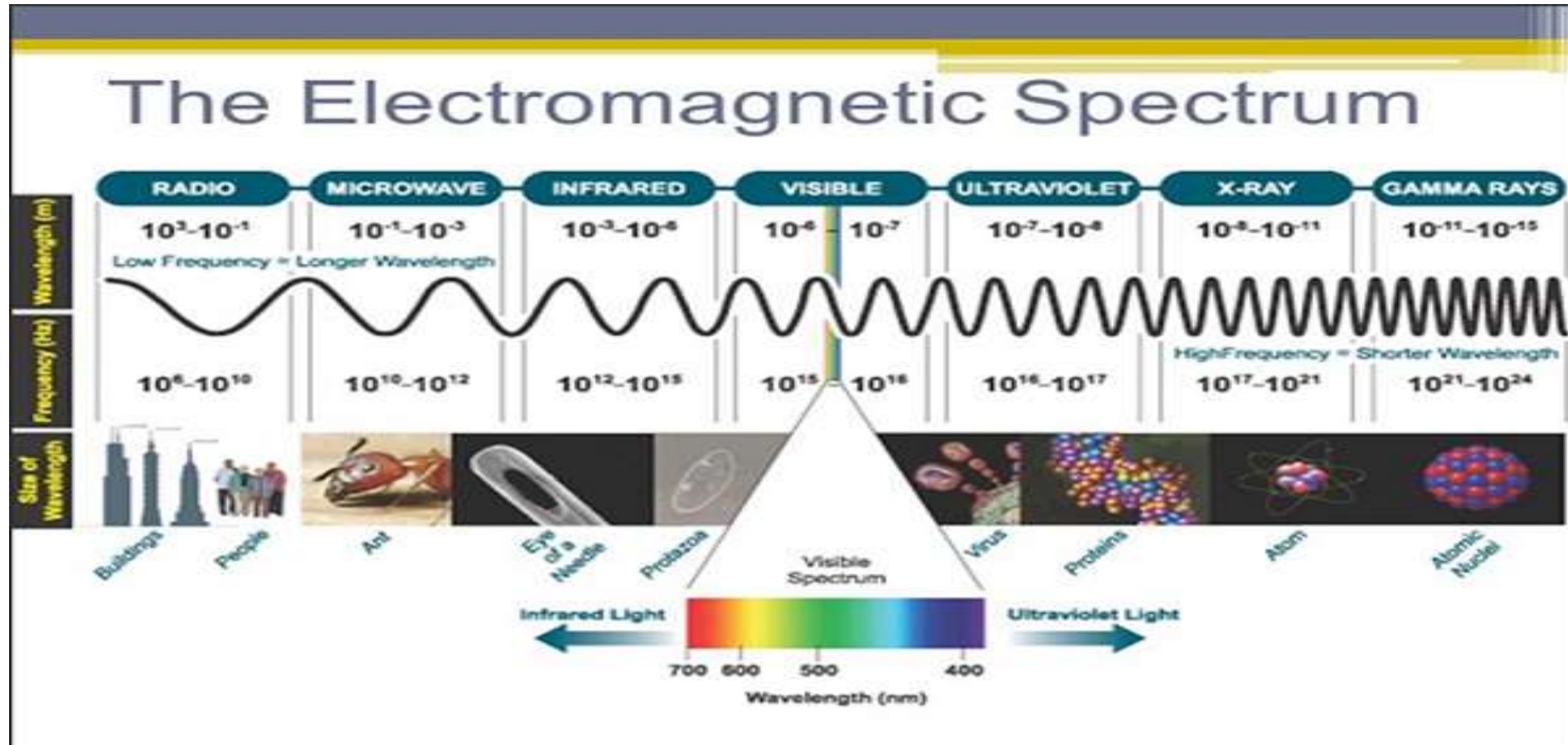
COURSE NAME : 19EC602 – Microwave and Optical Engineering

III YEAR / VI SEMESTER

Unit I- MICROWAVE ACTIVE DEVICES

Topic : Introduction to Microwave active devices

Electromagnetic Spectrum consists of entire range of electromagnetic radiation. Radiation is the energy that travels and spreads out as it propagates. The types of electromagnetic radiation that makes the electromagnetic spectrum is depicted in the following screenshot.





Let us now take a look at the properties of Microwaves.

Properties of Microwaves

Following are the main properties of Microwaves.

- Microwaves are the waves that radiate electromagnetic energy with shorter wavelength.
- Microwaves are not reflected by Ionosphere.
- Microwaves travel in a straight line and are reflected by the conducting surfaces.
- Microwaves are easily attenuated within shorter distances.
- Microwave currents can flow through a thin layer of a cable.



Advantages of Microwaves

There are many advantages of Microwaves such as the following –

- Supports larger bandwidth and hence more information is transmitted. For this reason, microwaves are used for point-to-point communications.
- More antenna gain is possible.
- Higher data rates are transmitted as the bandwidth is more.
- Antenna size gets reduced, as the frequencies are higher.
- Low power consumption as the signals are of higher frequencies.
- Effect of fading gets reduced by using line of sight propagation.
- Provides effective reflection area in the radar systems.
- Satellite and terrestrial communications with high capacities are possible.
- Low-cost miniature microwave components can be developed.
- Effective spectrum usage with wide variety of applications in all available frequency ranges of operation



Disadvantages of Microwaves

There are a few disadvantages of Microwaves such as the following –

- Cost of equipment or installation cost is high.
- They are hefty and occupy more space.
- Electromagnetic interference may occur.
- Variations in dielectric properties with temperatures may occur.
- Inherent inefficiency of electric power.



Any Query????

Thank you.....