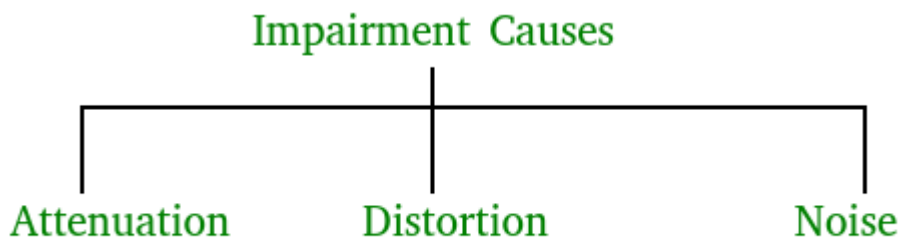


# Transmission Impairment

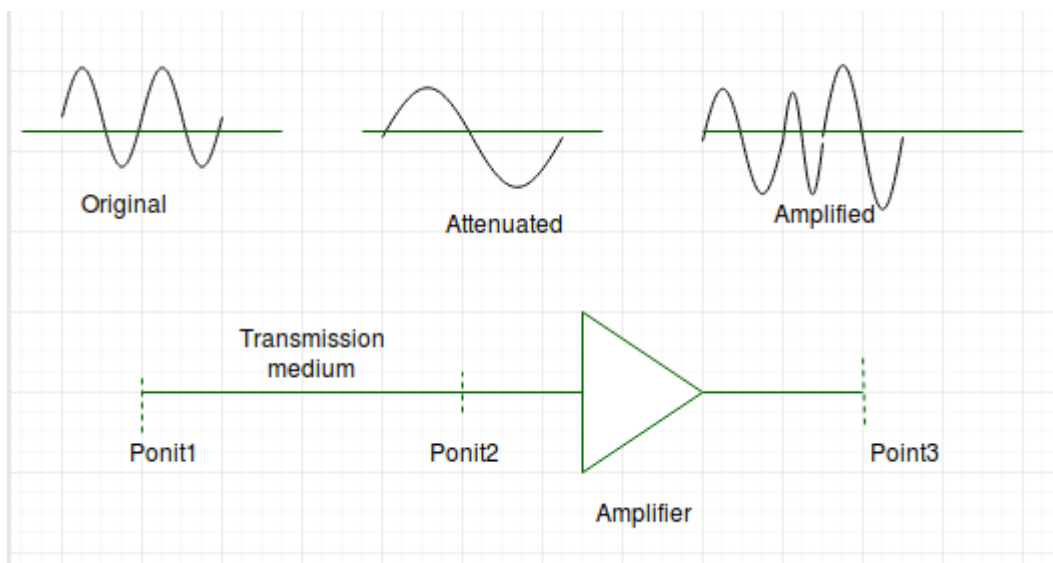
In communication system, analog signals travel through transmission media, which tends to deteriorate the quality of analog signal, which means that the signal at the beginning of the medium is not the same as the signal at the end of the medium. The imperfection causes signal impairment. Below are the causes of the impairment.

Causes of impairment –



Attenuation –

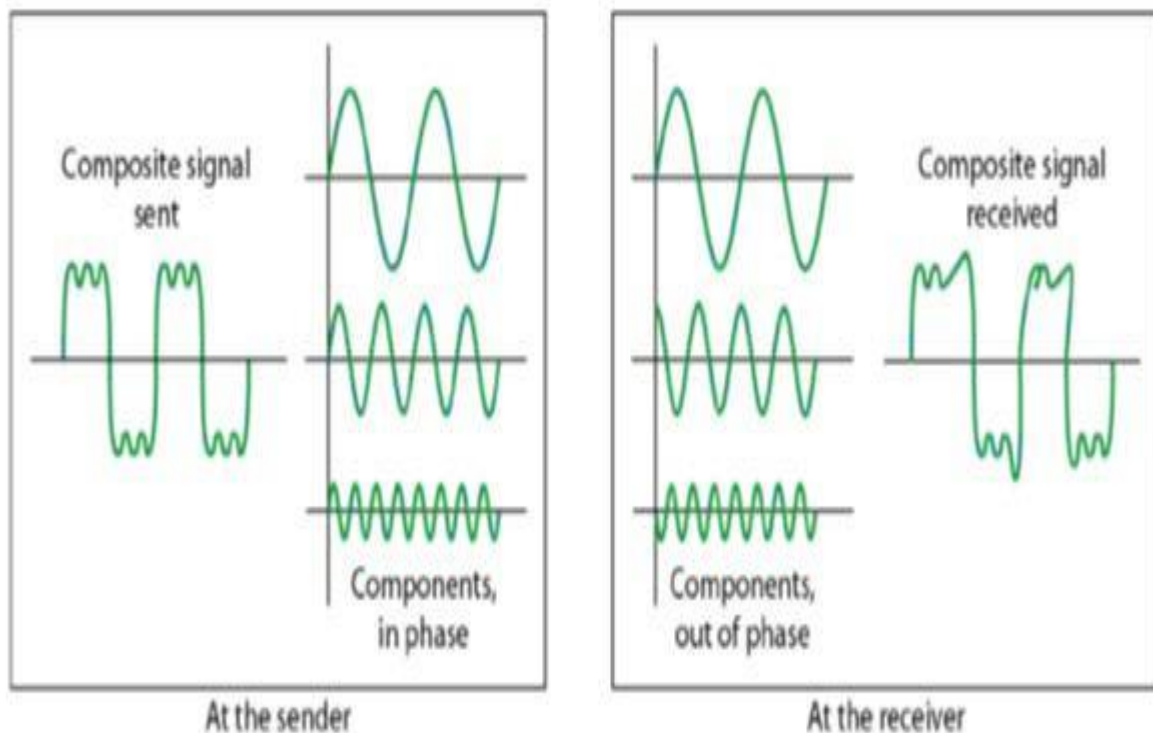
It means loss of energy. The strength of signal decreases with increasing distance which causes loss of energy in overcoming resistance of medium. This is also known as attenuated signal. Amplifiers are used to amplify the attenuated signal which gives the original signal back and compensate for this loss.



Attenuation is measured in **decibels(dB)**. It measures the relative strengths of two signals or one signal at two different point.

- **Distortion –**

It means changes in the form or shape of the signal. This is generally seen in composite signals made up with different frequencies. Each frequency component has its own propagation speed travelling through a medium. And thats why it delay in arriving at the final destination Every component arrive at different time which leads to distortion. Therefore, they have different phases at receiver end from what they had at senders end.



- **Noise –**

The random or unwanted signal that mixes up with the original signal is called noise. There are several types of noise such as induced noise, crosstalk noise, thermal noise and impulse noise which may corrupt the signal.

**Induced** noise comes from sources such as motors and appliances. These devices act as sending antenna and transmission medium act as receiving antenna.

**Thermal** noise is movement of electrons in wire which creates an extra signal.

**Crosstalk** noise is when one wire affects the other wire.

**Impulse** noise is a signal with high energy that comes from lightning or power lines

