



SNS COLLEGE OF TECHNOLOGY

(Autonomous Institution)

COIMBATORE-35

DEPARTMENT OF BIOMEDICAL ENGINEERING



19BME308 - Medical Radiation Safety

UNIT III - LASER AND ULTRAVIOLET RADIATION SAFETY

3.1 Classification of UV Radiation

Ultraviolet (UV) radiation

Ultraviolet (UV) radiation is similar to visible light in all physical aspects, except that it does not enable us to see things. The light that enables us to see things is referred to as visible light and is composed of the colours we see in a rainbow. The ultraviolet region starts right after the violet end of the rainbow.

In scientific terms, UV radiation is electromagnetic radiation just like visible light, radar signals and radio broadcast signals (see Figure 1). Electromagnetic radiation is transmitted in the form of waves. The waves can be described by their wavelength or frequency and their amplitude (the strength or intensity of the wave). Wavelength is the length of one complete wave cycle. For radiation in the UV region of the spectrum, wavelengths are measured in nanometers (nm), where 1 nm = one millionth of a millimetre.

Different wavelengths of electromagnetic radiation cause different types of effects on people. For example, gamma rays are used in cancer therapy to kill cancerous cells and infrared light can be used to keep us warm.

UV radiation has shorter wavelengths (higher frequencies) compared to visible light but has longer wavelengths (lower frequencies) compared to X-rays. UV radiation is divided into three wavelength ranges:



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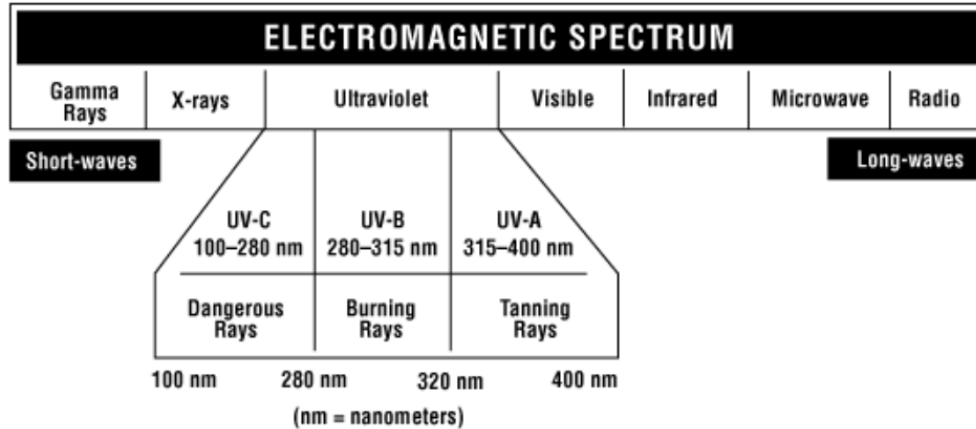


Figure 1 - Electromagnetic spectrum

Table 1 summarizes the general features of each type.

Ultraviolet Radiation Type	General Features
Ultraviolet A radiation (UVA, long-wave UV)	<ul style="list-style-type: none"> -not filtered out in the atmosphere -passes through glass -produces some tanning -once considered harmless but now believed harmful over the long term -levels remain relatively constant throughout the day
Ultraviolet B radiation (UVB, sunburn radiation)	<ul style="list-style-type: none"> -some filtered out in the atmosphere by the ozone layer -does not pass through glass -causes sunburn, tanning, wrinkling, aging of the skin and skin cancer -highest intensity at noontime
Ultraviolet C radiation (UVC, short-wave UV)	<ul style="list-style-type: none"> -filtered out in the atmosphere by the ozone layer before reaching earth -major artificial sources are germicidal lamps (to kill bacteria) -burns the skin and causes skin cancer