**Measurement of:** Reflectance, transmittance or absorbance characteristics of materials

**Equipment:** UV-Vis-NIR Spectrophotometer (LAMBDA 1050, PerkinElmer, USA)

**Property Measured:** Optical characteristics/parameters of materials

**Photograph (small size)**

![UV-Vis-NIR Spectrophotometer (LAMBDA 1050, PerkinElmer, USA)](image)

**Basic Principle:**
Electromagnetic radiation from a source is dispersed and the dispersed light is passed through the sample under study. The interaction of light with matter induces photo-induced electronic transitions between different bands by the absorption or emission of radiation at a characteristic frequency. The radiation after the interaction is studied as a function of incident wavelength with a suitable detecting system. The optical spectrometer consists of three main components of light source with monochromator, sample and reference port and the detecting system. This is a non-destructive method of evaluating optical characteristics of materials.

**Capabilities:**
The system is capable of measuring reflectance (diffuse/specular), transmittance or absorbance characteristics of a sample using the following modules:

1. **3-Detector Module:** Transmittance/absorbance measurements of liquids, solids, and films
   - Wavelength Range: 175 - 3300 nm

2. **Diffuse Reflectance Accessory:** Diffuse Transmittance/Reflectance of liquids and solids
   - Wavelength range: 200 - 2500 nm
   - Angular Range: Reflectance spectra at 10° intervals between 10° and 60°

3. **Universal Reflectance Accessory:** Analysis of optical reflectance (specular) of samples
   - Wavelength range: 200 - 2500 nm
   - Angular range: 8 – 68° incident angles

**Sample Requirement:**
Sample size should be more than 1 x 1 cm² irrespective of the measurement type for films and solids; for measurements on liquids sample minimum volume required is 100 microliter.