

Principal of Industrial Instruments

Total credit: 2 [Each unit has ½ credit].....Total hours 24

Unit-1 : Instrumentation in Physics and energy harvesting

- Multimeter: Principal of measurement of voltage of DC/AC and resistance, Digital multimeter: Block diagram
- Study of sound/noise using decibel meter
- Solar cells, Use of sunlight in electric generation
- Power generation, use of turbines in wind and hydrometer

Unit-2: Instrumentation in Chemistry

- Safety practices in chemistry laboratory
- Use of electronic balance in preparation of normal/molar and ppm solution.
- Study of pH of different solutions/Substrates
- Use of paper/TLC and column chromatography in detection of chemicals (d-glucose, and Sucrose) and certain toxins (Aflatoxins).
- Structure and use of colorimeter

Unit-3: Instrumentation in Biology

- Study Eukaryotic and prokaryotic cells (Bacteria) using Gram staining
- Study of microbes present in soil
- Determination of viability of seeds and plant biomass.
- Use of extraction methods (soxhlet, separating funnel) for plant based compounds
- Detection of carbohydrates (Starch), protein and oils in plant cells

Unit-4 : Instrumentation in Agriculture/Tissue culture/ Biochemistry

- Methods of sterilization of culture medium (use of autoclave and oven)
- Structure and use of laminar air flow in plant tissue culture
- Study of cellulose degrading enzymes
- Different components of human blood & methods of cell count using hemocytometer.

Note: Demonstration of available instruments should be done as per availability of these in a college. This will help in enhancing the understanding of the subject and proper working of the instruments.