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ELECTRICAL ELECTRONICS ENGINEERING

### (1) Sensors for Biomed Applications

The sensors used for Biomed Applications are mainly Physical Sensors. Physical Sensing is a unique sensing platform, where sensing devices are responsive towards physical properties of flow, heat, pressure, magnetic field, and parameters related to mass or energy and convert them into signals for quantification.

Examples: Radiation Sensors - Magnetic Sensors  
- Mechanical Sensors - Optic Sensors  
- Thermal Sensors

### Activities of Biomedical Applications

- Micro-electromechanical System (MEMS) based actuators, which transduce certain forms of energy into mechanical movement, in the microscopic scale are increasingly contributing to areas of biomedical engineering and healthcare applications.

Applications of MEMS-Based Sensors include devices, microneedles.

Examples of Actuators used in Biomedical Applications are:

Thermoresponsive actuators, electromagnetic actuators, fluid-driven actuators.

## 2 Basic Measuring Instruments

### Voltmeter

Voltmeter is a measuring instrument which measures the voltage across any two points of an electric circuit.

#### Types

##### Dc Voltmeter

As the name suggests, Dc Voltmeter measures the Dc voltage across any two points of an electric circuit.

##### Ac Voltmeter

Ac Voltmeter measures the Ac voltage across any two points of an electric circuit.

### 3 SPHYGMOMANOMETERS

Used during general anesthetic procedures it is used for monitoring the vital signs, specifically blood pressure, heart rate and rhythm, heart sounds, and breath sounds. Appropriate. See blood pressure cuts for the sphygmomanometers must be utilized for accurate blood pressure values.

- Electrocardiograph

Electrocardiograph machines are typically used on patients who have suffered heart damage, are at risk of heart disease, or experience symptoms that may be caused by any number of heart related problems. These machines perform electrocardiograms also called ECGs or EKGs, which measure harmless electrodes that are connected to the patients chest, arms or legs.