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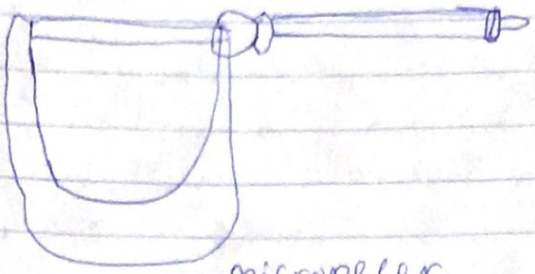
Biomedical Engineering
18/Eng08/1015
BME 311 Assignment

1(a) Sensors for biomedical applications
They take signals representing biomedical variables and convert them into electrical or optical signals. As such, the biomedical sensor serves as interface between a biological and electrical system.
Examples are
- GSR sensor (galvanic skin response)
- EMG sensor (Electromyography)
- Heart rate sensor

b) Actuators for biomedical applications
An actuator is a component of a machine that is responsible for moving and controlling a mechanism or system. It is a part of a device or machine that helps it to achieve physical movements by converting energy, often electrical, air or hydraulic, into mechanical force.
Examples include:
- Scanners (CT, MRI)
- laser positioning equipment
- Tonometer
- Dental chairs

2 Basic measuring instrument
A micrometer, also known as micrometer screw gauge is a device incorporating a calibrated screw widely used for accurate measurement of components. They are used in telescopes or microscopes to measure the apparent diameter of celestial bodies or microscopic objects

Example -> large micrometer caliper, blade micrometer, Pitch-diameter micrometers, tube micrometer, bore micrometer.



micrometer

3. Case study

a) ~~Temperature~~

a) Sphygmomanometer

The Sphygmomanometer are used during general anesthetic Procedures. It is used for monitoring vital signs especially blood Pressure, heart rate and nythm, heart Sound and breath Sounds. Appropriate size blood Pressure cuff's for the Sphygmomanometers must be utilized for accurate blood Pressure values. An improperly sized blood pressure cuff that is too small will give an incorrectly high reading; Inversely, a blood Pressure cuff that is too large will give an artificially low reading. The blood Pressure cuff should span a minimum of 80% of the Patients upper arm circumference to Provide an accurate reading.

b) Electrocardiograph

Electrocardiograph machines are typically used on Patients who have suffered heart damage, are at a high risk for heart disease, or experience symptoms that may be caused by any number of heart-related Problems. These machines Perform electrocardiagrams also known as ~~electrodia~~ ECGs or EKGs, which measure the electrical activity of a Patients heart through harmless electrodes

that are connected to the patients chest arms and legs.