



SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF MECHANICAL ENGINEERING



SENSORS AND INSTRUMENTATION



Guess Today's Topic????





Errors in Measurement



- Measurement systems can be subject to various types of errors, which can affect the accuracy and reliability of the measurements. Here are some of the common types of errors in a measurement system:





Errors in Measurement



- **Systematic error:** This is an error that occurs consistently in the same direction and magnitude, regardless of the actual value being measured. Systematic errors can be caused by factors such as calibration errors, environmental factors, or instrument drift.





Errors in Measurement



- Random error: This is an error that occurs unpredictably and is caused by factors that are difficult to control, such as fluctuations in the input quantity, variations in the operator's technique, or limitations in the measurement instrument's sensitivity. Random errors can be reduced by averaging multiple measurements.





Errors in Measurement



- Gross error: This is an error that occurs due to human error, such as incorrect data entry or misreading of the measurement instrument. Gross errors can be minimized by proper training and use of standard procedures.





Errors in Measurement



- Interference error: This is an error that occurs due to external factors interfering with the measurement, such as electromagnetic interference or vibrations from machinery.





Errors in Measurement



- Resolution error: This is an error that occurs due to the limited resolution of the measurement instrument. It can be minimized by using instruments with higher resolution or by interpolating between readings.





Errors in Measurement



- Bias error: This is an error that occurs when the measurement system is biased towards a certain value or range of values. Bias errors can be caused by factors such as instrument drift, calibration errors, or operator bias.





Errors in Measurement



- Sampling error: This is an error that occurs when only a portion of the population being measured is sampled, leading to inaccuracies in the measurement. Sampling errors can be minimized by using representative samples and increasing the sample size.
- It is important to identify and minimize errors in a measurement system to ensure accurate and reliable measurements. This can be achieved through proper calibration, standard procedures, and regular maintenance of the measurement instruments.





*Thank
you*

