

ME 3113
Measurements and Instrumentation

Chapter 1

Introduction, Basic Concepts of Measurement Methods



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Hamed Hatami-Marbini, Summer 2014

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Major Course outcomes:

- Present data in an appropriate manner through the use of tables and graphs.
- Distinguish between the different measurement errors and how errors are classified
- Estimate the uncertainty of a set of measurements and propagate the measurement uncertainty.
- Describe time varying signals in both the time and frequency domains.
- Describe the underlying physical effects of a transducer on the measurement.
- Process a signal from a transducer by using appropriate processing techniques.
- Make measurements of engineering physical quantities of interest.



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Being able to answer the following questions:

- Given a physical parameter (temperature, vibration, etc.), how do we measure it?
- What are we measuring?
- How do sensors work? What are their limitations?
- How do we design a sensor for a specific task?
- How is the data recorded? How do we choose the data acquisition parameters?
- What can be determined from the data?
- How do we analyze and present the data?



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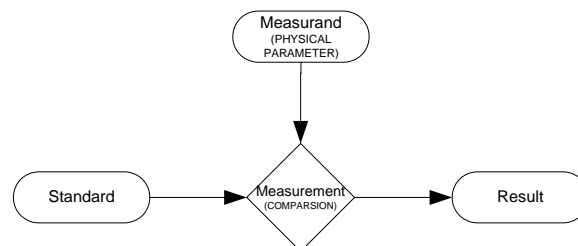
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Definition:

A measurement is the act of assigning a specific value to a physical variable. The measured variable (measurand) is the physical variable.

The goal of a measurement system is to convert the sensed information into what can be easily quantified.



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