

FACULTY OF **ENGINEERING**

DEGREE COURSE: **INDUSTRIAL ENGINEERING BS**

**SUBJECT:** MECHANICAL AND THERMAL MEASUREMENTS

**LECTURER:** MILENA MARTARELLI

E-mail: milena.martarelli@uniecampus.it

---

## **OBJECTIVES**

The course is aimed at:

- 1) Providing students with the basic principles describing measurement instruments.
- 2) Developing an understanding of the operating principles of several specific thermal and mechanical measurement systems.
- 3) Providing the means for the treatment of sensors dynamic response for all type of inputs using frequency response.

---

## **CONTENTS**

The course consists of two parts:

1. General concepts
  - Metrological basic definitions
  - Generalised configuration and functional descriptions of measuring instruments
  - Static and Dynamic generalized performance characteristics of instruments
  - Data acquisition principles and systems.
2. Measuring devices:
  - Motion measurement systems
  - Force, torque and shaft power measurement sensors
  - Pressure and sound measurement transducers
  - Flow measurement devices
  - Temperature measurement instruments.

---

## **LEARNING OUTCOMES**

At the end of the course, students will:

- learn the basic principles for describing the generalized performance characteristics of measurement instruments
- be able to comprehend the operating principles of the thermal and mechanical measurement systems addressed within the course and to design complete measurement chains based on those sensors
- learn how to treat sensors dynamic response for all type of inputs through frequency response.

---

## **ASSESSMENT**

Written exam: multiple choice and open questions

---

## **RECOMMENDED TEXTBOOKS**

Ernest O. Doebelin, "Measurement systems: application and design", McGraw-Hill International Edition

---

