

ENGINEERING FOR SAFETY OF CRITICAL INDUSTRIAL AND CIVIL

(Lecce - Università degli Studi)

Teaching MEASUREMENTS AND SENSORS FOR INFRASTRUCTURES

GenCod A007229

Owner professor Aime LAY EKUAKILLE

Teaching in italian MEASUREMENTS AND SENSORS FOR INFRASTRUCTURES

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SSD code ING-INF/07

Reference course ENGINEERING FOR SAFETY OF CRITICAL INDUSTRIAL AND

Course type Laurea Magistrale

Credits 6.0

Teaching hours Front activity hours: 54.0

For enrolled in 2024/2025

Taught in 2024/2025

Course year 1

Language ENGLISH

Curriculum CIVIL INFRASTRUCTURES

Location Lecce

Semester Second Semester

Exam type Oral

Assessment Final grade

Course timetable

<https://easyroom.unisalento.it/Orario>

BRIEF COURSE
DESCRIPTION

MEASUREMENTS AND SENSORS FOR INFRASTRUCTURES

Part I

Introduction

Measurement concepts

Uncertainty and its determination

Metrological features

Analog and digital measurement chains

Electrical, magnetic, mechanical and thermal sensors

Part II

CBRN Sensors and sensing systems

1) chemical devices

2) biological devices

3) Radiological devices

4) Nuclear devices

Filters and Instrumentation for measurement

Part III

Applications, exercises and laboratory for SCICI

Construction of circuits for acquisitions from sensors

Ground measurements and insulation

Electrical quantities measurements

Infrared measurements

1) Monitoring fluid pipelines: waterworks, and oil and gas pipelines

2) Civil facilities: bridges, and buildings

3) Bunkers, shelters, and military facilities

4) Nuclear depots

5) Petrochemical facilities

6) Power plants

7) Monitoring disasters due to/within SCICI

Simulations using Matlab, Labview, Solidworks, Comsol, and Proteus

REQUIREMENTS

Basic knowledge of Electrical Engineering (Theory of Circuits), Physics, hopefully Electronics (Fundamentals) are necessary

COURSE AIMS

Making students aware of the use of monitoring systems for safety of critical industrial and civil infrastructures (SCICI) in the efforts to control them during and after a wrong operating mode. Giving them the capability of designing and characterizing monitoring systems.

TEACHING METHODOLOGY

Lessons, exercises, and laboratory activities

ASSESSMENT TYPE

Oral and/or written, after an assigned project assessment.

REFERENCE TEXT BOOKS

Materials from the Professor that will be available within the Team repository/platform