



ANNEX 2.1

DEGREE PROGRAM DIDACTIC REGULATIONS INGEGNERIA STRUTTURALE E GEOTECNICA (STRUCTURAL AND GEOTECHNICAL ENGINEERING)

CLASS LM-23

School: Polytechnic and Basic Sciences

Department: Structures for Engineering and Architecture

Didactic Regulations in force since the academic year 2024-2025

Course: Experimental Calculus of Materials and Diagnostics of Structures	Teaching Language: Italian
SSD (Subject Areas): ICAR/08	CREDITS: 9
Course year: I/II	Type of Educational Activity: art. 10 c.5b del DM 270/04 - Educational activities in one or more subject areas similar to or supplementary to the basic and characterizing ones.
Teaching Methods: In presence	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Measurements and instrumentation - Setup of experiments, calibration and sensitivity, acquisition of signals. Data analysis. Estimation of the uncertainty of the measurement. Instruments and methods for carrying out the tests: instruments for measuring displacements, forces, strains, temperatures, crack opening, slope, vibrations and stresses, forces generation. Laboratory instruments. Experimental mechanics methods of strain and stress state analysis, photoelasticity, digital image correlation, Moiré methods, interferometry, speckle methods, thermoelastic effect, electrical strain gauge and strain gauge with optical fibers. Material Controls - The mechanical properties of structural materials and their mechanical characterization. Experimental campaigns. Crisis mechanisms. Masonry: controls with NDT techniques (non-destructive), sonic investigation, investigation with flat jacks, endoscopic investigation. Controls and experimentation on structures - Measuring systems for the control of deformations and displacements. Manual and automatic acquisition of displacement fields. Load tests on structures. Outline of system dynamics, structural response. Monitoring techniques: continuous, with fiber optic techniques, dynamic. The problem of structural identification and inverse problem of mechanics: framing of the problem and methods of identification. Static tests, processing of results. Structural diagnostics - Importance and outlining of the problem, cracks and instability on existing structures: visual analysis, survey of cracking frameworks, interpretation of causes.	
Objectives: At the end of the course, students will have acquired the basic theoretical concepts of experimental analysis and diagnostics combined with practical experiences in order to apply the methods and tools of the discipline to experimental stress analysis, non-destructive testing and structural monitoring. All aspects that are very useful in their future work as engineers.	
Propaedeuticities: None. The fundamental concepts will be reintroduced, so students are not required to have a specific basic training. Of course, reference is made to basic knowledge of Structural Mechanics and Structural Engineering .	
Is a propaedeuticity for: None	
Types of examinations and other tests: Oral exam	