



CIVIL ENGINEERING



PORTFOLIO



STRUCTURES AND CONCRETE LABORATORY

LABORATORY TESTS

- Concrete quality control
- Compressive strength test on concrete core
- Static load tests on existent structures
- Full-scale building components test
- Special composition studies of concrete and grouts
- Permeability, water absorption and capillarity tests
- Abrasion & Wear Testing
- Mechanical material characterization (Compression, tensile and flexure)
- Non-destructive tests on concrete
 - Penetration resistance test
 - Ultrasound propagation velocity measurement
 - Concrete surface hardness evaluations
 - Measurement of cover and reinforcements detection
 - Pull-out tests
 - Pull-off test

CONSULTANCY AND TECHNICAL REPORTS

The activities carried out are mainly directed towards the resolution of technical problems posed by industry, the transfer of know-how and advanced technology to the users.

- Survey and condition assessment of existent constructions
- Structural and Seismic assessment
- Structural health monitoring
- Numerical modelling of steel structures
- Evaluation on structural behaviour of steel, wooden, concrete and masonry structures
- Mechanical characterization of structural elements and a mechanical and physical characterization of materials. The laboratory is also able to carry out surveys and condition assessment on existing buildings.



GEOTECHNICS AND ROAD CONSTRUCTION LABORATORY

LABORATORY TESTS

Extraction and testing of soil samples to determine geotechnical parameters.

Classification of soil and aggregates.

Some of the equipment and tests performed:

- Granulometric analysis
- Atterberg limits
- Permeability test
- Oedometric units – consolidation test
- Triaxial test and direct shear test
- California Bearing Ratio Test (CBR Test)
- Marshall test
- Proctor compaction test
- Los Angeles Abrasion Test
- British pendulum test
- Nuclear gauge compaction testing

CONSULTANCY AND TECHNICAL REPORTS

- Consultancy and advisement in the area of geotechnics, geology and road solutions
- Geological risk analysis
- Geotechnical and geological studies and evaluation of soils or areas (slopes, for example)
- Technical reports on geotechnical solutions
- Expert technical reports about works
- Technical expertise in the context of court proceedings



PLANNING, TRANSPORT AND GEOGRAPHIC INFORMATION SYSTEMS LABORATORY

ABILITY

Sustainable Mobility Studies

- Analysis of mobility patterns in an urban context
- Transport system planning

Road Safety Evaluation

- Study and monitoring of measures promoting safe, efficient and sustainable trips

Geographic Information Systems and Remote Sensing

- Spatial Analysis and modelling using GIS tools
- Production of hazard maps, land cover and land use cartography using remote sensing processes
- Geo-referencing mapping and topographic surveys. Geographic monitoring and information management

CONSULTANCY AND PREVIOUS STUDIES

- Road network management studies
- Assessment of traffic signaling conditions, road safety and road pavement studies
- Collection and processing of urban data
- Mobility plans and sustainable urban accessibility
- Cartography data acquisition process

EUROPEAN PROJECTS

TaT Project

“Students Today, Citizens Tomorrow”

Promotion of environmentally sustainable transport modes in Academic Campuses.

Development of measures and strategies to promote the use of environmentally friendly transport modes in an urban context.



CONSTRUCTION MATERIALS LABORATORY

LABORATORY TESTS

- Clay masonry units (EN 772)
- Concrete masonry units (EN 772)
- Concrete kerb units (EN 1340)
- Concrete paving blocks (EN 1338 - deformation, water absorption, friction)
- Wood
 - Moisture content (NP 614)
 - Density (NP 616)
 - Structural timber – strength classes (NP 4305)
 - Static bending (EN 408)
 - Shear (NP 623)
- Acoustics parameters in buildings
 - Sound insulation, airborne sound and impact sound (ISO 140)
 - Reverberation time (ISO 354)
- Bitumen and bituminous binders
 - Needle penetration (NP 82/EN 1426)
 - Softening point (EN 1427, ASTM D36 or LNEC E34)

CONSULTANCY AND TECHNICAL REPORTS

- Analysis of pathologies and constructive anomalies in buildings
- Monitoring and evaluation of the buildings' behaviour
- Evaluation of processes and construction systems
- Inspection and evaluation of building water and sewer networks
- Prescription of thermal insulation systems in buildings
- Prescription and evaluation of acoustic insulation in buildings
- Preparation of technical reports
- Engineering Design Review

CONTACT

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HYDRAULIC, WATER RESOURCES AND ENVIRONMENT LABORATORY

ABILITY

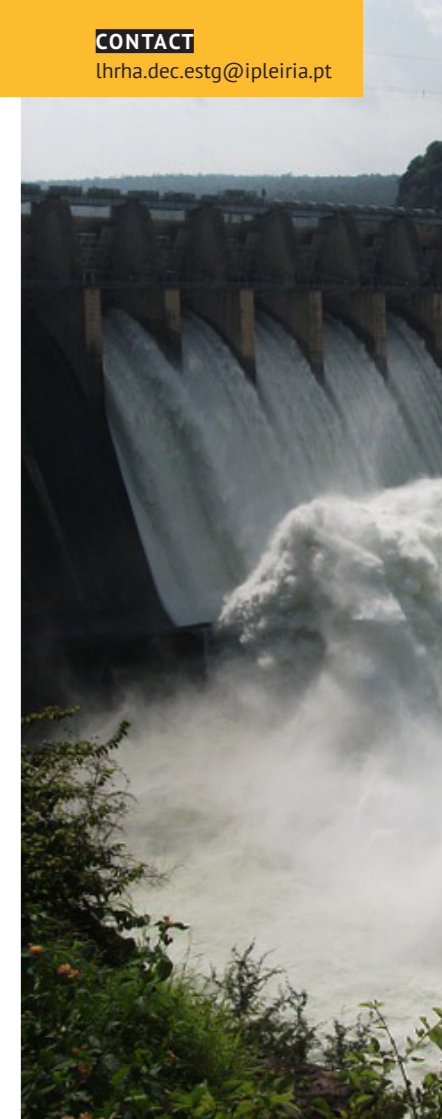
- Water supply system modelling
- Urban drainage system modelling
- Water and energy efficiency
- Water quality
- Fluvial hydraulics
- Benchmarking

CONSULTANCY AND TECHNICAL REPORTS

- Consultancy in the scope of the management and operation of water supply systems
- Consultancy in the scope of the management and operation of urban drainage systems
- Elaboration of specific flood risk maps
- Hydrogeological studies for abstraction of groundwater
- Studies of perimeters of protection of water abstractions
- Support and action plans for water and energy efficiency
- Water quality assessment studies

CONTACT

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TeSP CONSTRUCTION AND REHABILITATION

HIGHER PROFESSIONAL TECHNICAL COURSE

The completion of Higher Professional Technical Courses (TeSP's) leads to the obtention of a diploma equivalent to a "level 5" of the Portuguese National Qualifications Framework.

OBJECTIVES

To train professionals with high technical skills, able to participate in the management of the existing housing stock as well as being able to set, organize and coordinate the distinct stages of construction works related to the conservation and rehabilitation of buildings.

ENTRY REQUIREMENTS

- High-school graduates or holders of equivalent degrees.
- CET graduates (see the Portuguese National Qualifications Framework), TeSP graduates or holders of a first-cycle higher education degree, seeking professional requalification.
- Students approved in the M23 tests (see the Portuguese law – Decree-Law no.64/2006, of 21 March)

FURTHER STUDIES

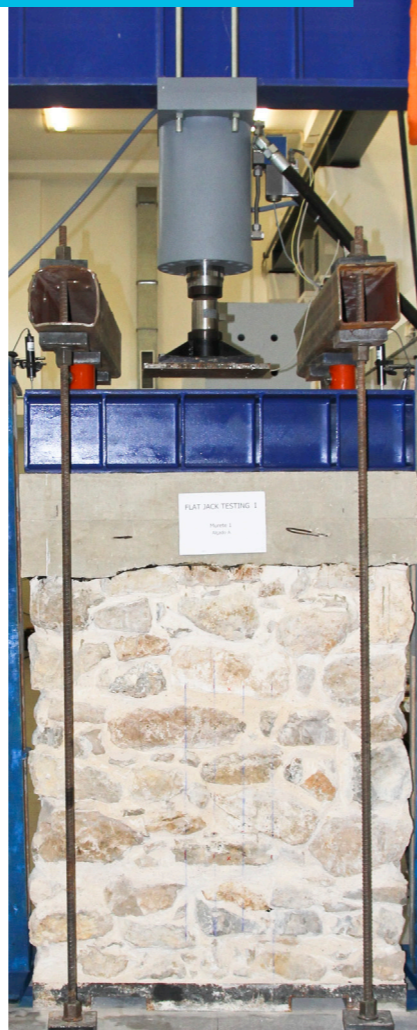
The graduates do not need to take the specific entry tests required for the access to the (first-cycle higher education) degree in Civil Engineering.

JOB OPPORTUNITIES

- Public administration (central, regional and local institutions)
- Public and private institutions holding housing stock requiring maintenance and/or conservation interventions
- Construction companies and public works
- Construction and civil engineering companies and public works
- Project management and construction inspection companies
- Building conservation companies
- Companies specialized in the management of condominiums

CONTACT

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TeSP INFORMATION SYSTEMS AND URBAN SPACE MODELLING

HIGHER PROFESSIONAL TECHNICAL COURSE

Higher Professional Technical Courses (TESP's) leading to the obtention of a diploma equivalent to a "level 5" of the Portuguese National Qualifications Framework.

OBJECTIVES

To train professionals with high technical skills, able to design and cooperate in the development of applications in the field of Geographic Information Systems (SIG), perform land surveys, manipulate geospatial data, use Building Information Modelling (BIM) systems to support the modelling of building and infrastructures in urban spaces, design, manage buildings and infrastructures throughout their life cycle.

ENTRY REQUIREMENTS

- High-school graduates or holders of professional qualifications.
- CET graduates (see the Portuguese National Qualifications Framework), TESP graduates or graduates of a first-cycle higher education degree, seeking professional requalification.
- Students approved in the M23 tests (see the

Portuguese law – Decree-Law no. 64/2006, of 21 March)

FURTHER STUDIES

The graduates do not need to take the specific entry tests required for the access to the (first-cycle higher education) degrees in Civil Engineering and Informatics Engineering.

PROFESSIONAL OPPORTUNITIES

- Public administration institutions (central, regional and local)
- Town Halls
- Engineering Project Design Companies
- Mapping Companies

CONTACT

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CIVIL ENGINEERING BACHELOR/UNDERGRADUATE COURSE

OBJECTIVES

The aim of the bachelor course is to provide professionals with a sound scientific, technical, ethical and professional knowledge, which enable them to acquire the necessary skills to conceive, design, implement and manage projects in the various areas of civil engineering such as those of structures, buildings, geotechnical engineering, hydraulics, territorial and transport planning, the environment and civil engineering sciences in general.

(European Network for Accreditation of Engineering Education). The distinction confirms the quality of education in this particular field of study, placing this bachelor among those of the best European universities and polytechnics.

PROFESSIONAL OPPORTUNITIES

- Design and consulting offices
- Construction and public works companies
- Building inspection, planning, management of water and environmental resources, both central and local government entities as well as private companies.

EUR-ACE® QUALITY MARK

IPLeiria is the first Polytechnic Institute in Portugal to be granted the EUR-ACE® label for the bachelor (1st cycle) Civil Engineering course recognized by ENAEE



MASTER DEGREE IN CIVIL ENGINEERING BUILDING CONSTRUCTIONS

OBJECTIVES

To give a specialization of professional nature, allowing a sequence of studies to the holders of a bachelor's degree in civil engineering, and similar areas, enabling improvements of the knowledge in areas of Construction, Structures, Geotechnics, Hydraulics and the Environment, Planning and Transport. The course has two editions in Portuguese and English. Throughout the course, students will develop original applications in a specific area, through the realization of a dissertation, project, or internship.

PROFESSIONAL OPPORTUNITIES

- Design Project and consulting offices
- Construction Companies and administration
- Supervision of construction works, planning of water resources and environmental management, both in central and local government administration as well in private companies.
- Management and operation of water services, waste water and solid waste treatment
- Town Hall, insurance and financial companies

EUR-ACE® QUALITY MARK

IPLeiria is the first Polytechnic Institute in Portugal to be granted the EUR-ACE® label for the Master (2nd cycle) Civil Engineering course recognized by ENAEE (European Network for Accreditation of Engineering Education). The distinction confirms the quality of education in this particular field of study, placing this Master course among those of the best European Universities and Polytechnics.

INTERNATIONALIZATION

The Department Of Civil Engineering has three double degree programs that give students the opportunity to take Masters degrees, in two different institutions, during the period of 2 years. By means of these agreements, students enrolled in one of these programs could be awarded with both degrees:

- **Master in Civil Engineering**
Building Construction (IPLeiria) / Master in Civil Engineering (Donbas National Academy of Civil Engineering and Architecture)

- **Master in Civil Engineering**
Building Construction (IPLeiria) / Master in Civil Engineering (Polostk State University)
- **Master in Civil Engineering**
Building Construction (IPLeiria) / Master in Civil Engineering Industrial and Civil Construction (Azerbaijan University of Architecture and Construction)

These double degrees were established under the project RETHINKe and Tempus Programs.

The **Department of Civil Engineering (DCE)** was created in 1994 with the aim of offering advanced training in the area of Civil Engineering. Currently DCE offers two Technological Specialization courses, the Civil Engineering undergraduate course, an International Master Degree in Civil Engineering - Building Constructions, and three International Master Double Degree Programs with the Polostk State University, the Donbas National Academy of Civil Engineering and Architecture and the Azerbaijan University of Architecture and Construction.

Its main objective is to offer students a high level of scientific and technological knowledge granting them the skills and competences necessary to design, execute and manage tasks in areas as diverse as structures, buildings, hydraulics, planning and transportation as well as Civil Engineering sciences in general.

DCE has five laboratories:

- Laboratory of Structures and Concrete
- Laboratory of Geotechnics and Road Construction
- Laboratory of Hydraulics, Water Resources and Environment
- Laboratory of Construction Materials
- Laboratory of Planning, Transport and Geographic Information Systems

In addition to ensuring the students' practical training component, these laboratories also support research and development activities within the framework of the scientific activity of the lecturers and provide services to the community and civil engineering companies.



**POLITÉCNICO
DE LEIRIA**

ESCOLA SUPERIOR
DE TECNOLOGIA
E GESTÃO



European
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