Degree course	Master degree in Architecture-Restoration
Course code	
Lecturers	Aurora Angela Pisano/ Raffaele Pucinotti
Course name	Technical Consultancy in the Judicial Field
Disciplinary area	Civil Engineering and Architecture
Disciplinary field of science	ICAR/08 Solids and Structural Mechanics ICAR/09 Structural Engineering
University credits - ECTS	8 (4+4)
Teaching hours	80
Course year	First
Semester	Second

Synthetic description of the course

The course provides the necessary technical and scientific skills for preparing technical advice for both the Judicial Authority and public and private entities.
The course mainly refers to the structural aspects of civil constructions; in particular, the educational path aims to train experts with adequate professionalism to address the typical problems of Forensic Sciences, to examine and discuss expert opinions and consultancy. The above quoted advice can be produced as an office technical consultant (CTU) in civil and criminal proceedings, as an part expert consultant (CTP) or as a technical verifier in administrative justice.

Course entry requirements

None

Course programme

Concepts, methods and tools of forensic sciences. Direct and inverse problem.
The role of forensic science in judicial proceedings.
Civil court proceedings - Procedures and roles from a technical point of view in the civil context.
Criminal court proceedings - Procedures and roles from the technical point of view in the criminal context.
The requirements of the Judicial Technical Consultant.
Alternative dispute resolution.
Ethics, deontology, due diligence.
Collapses and building damages: investigation procedures.
Construction materials and their mechanical characteristics. Destructive and non-destructive investigations aimed at assessing the levels of reliability of buildings in steel reinforced concrete and masonry.
Evaluation of the resistance and the compliance of concrete in existing structures.
Complaints about data relating to the cubes of concrete and related acceptance checks;
Evaluation of the concrete resistance of the concrete for testing purposes;
Evaluation of the resistance in place in order to establish possible responsibilities of the concrete producers;
Evaluation of the safety of buildings in steel reinforced concrete .: case studies.
Evaluation of the safety of masonry buildings: case studies.
Traditional and innovative monitoring techniques in the structural field.
Sensory tools, management and detection models.

Experimental dynamics of structures.
Fire behavior of materials (heat transmission and mechanical decay) and modeling of fire scenarios (zone models, localized fire). Explosion modeling.
Fire prevention in buildings and analysis of the post-fire scenario.
Post-fire diagnostics. The basis of fire investigation in forensic procedures.
Support for modeling in back-analysis of fires.
Analysis of the instabilities in the structures in c.a. and walls.
Case studies

Expected results

The student must possess a basic knowledge of the rules and roles that characterize the activities of a technical consultant. The student must also acquire a general methodology for the drafting of a technical consultancy with particular reference to the problems that are present in structures of civil engineering.

Course structure and teaching

Lectures *(hours/year): 60*
Exercises *(hours/year): 20*

Student's independent work

Exercises, Applicative work and practical tests.

Testing and exams

The acquired knowledge will be verified through the discussion of an original project produced by the Student.

Suggested reading materials

1. Franco Bontempi, Ingegneria Forense in campo strutturale, Dario Flaccovio Editore, 2017;
2. Raffaele Pucinotti, Patologia e Diagnostica del Cemento Armato, Dario Flaccovio Editore, 2006;
3. Concrete Society, Assessment, design and repair of fire-damaged concrete structures, TR 68, 2008;
4. Appunti distribuiti durante le lezioni dai docenti.