

# **DURABILITY AND SUSTAINABILITY OF REINFORCED CONCRETE STRUCTURES**

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## **Program:**

Concrete as a structural material: physical and mechanical properties. Basic concrete components, binders, supplementary cementing materials, chemical admixtures. European and Italian normative about re-use of recycled and manufactured aggregates in concrete.

Hydration, heat transport, moisture transport. SCM efficiency factor. Rheology of fresh concrete.

Damage and degradation in concrete: from visual inspection to identification of degradation mechanisms: carbonation, chlorides-induced corrosion, volume stability, ASR, acid attack, freezing-thawing, errors during casting, inappropriate design. Case-studies.

Durability and service life models.

Environmental life cycle assessment of reinforced concrete structures. Circular economy: market barriers and future perspectives. Case-studies.

Applications, practical exercises, Q&A and quizzes during the course.

## **References:**

Slides of the course.

## **Examination and grading:**

Homework.

## **Course details:**

Both in person and online. The course will take place in February 2022.