ENVIRONMENTAL AND SUSTAINABLE BUILDING ENGINEERING
ACADEMIC YEAR 2020/2021

DIGITAL MODELING FOR ARCHITECTURE

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Contents

A fundamental tool of the engineer who works in the field of building constructions and environmental systems is the geometric digital model. The Digital Modeling for Architecture course addresses the definition of the abstract model, which has its roots in solid geometry and which develops from the conformation of the built space. The representation is here understood both in the canonical form of the 2D graphic model and in the more modern form of the informatic and informed 3D model, as it is built in a BIM (Building-Information-Modeling) environment. The use of survey data acquired through terrestrial laser scanners (TLS), integrated in a continuous parametric modeling environment, can provide an effective method of knowledge and communication of an architectural asset. Furthermore, the control of the geometries through visual programming allows a facilitation in terms of parameter management, which corresponds to a cascade propagation of the changes and an explanation of the design path. The course aims to provide basic tools and knowledge to be able to deal with the knowledge of a built architecture and, consequently, be able to operate coherently in virtual space.

Teaching

The course provides 9 ECTS (European Credit Transfer and accumulation System) in the scientific disciplinary sector Icar17. Pre-requisites of the course: the basic notions of CAD at a two-dimensional level and principles of design and architectural composition will be will be taken for granted, as well as the knowledge of the graphic language relating to the representation of architecture (plans, elevations and sections in the various scales of representation).

3ECTS: Survay

Theoretical foundamentals and methodologies of architectural survey. Integrated digital survey.
Principles of 3D shape acquisition.

Software: **Autodesk Recap PRO. Autodesk Recap Photo. Cloud Compare. RDF.**

3ECTS: BIM

Introduction to BIM processes, digital environment and main modeling tools.

Software: **Revit di Autodesk**.

Together with the technical notions, the student will be assigned an architecture topic to study the principles of design through bim processes

3ECTS: Solid geometry & Visual Programming Language

Introduction to generative parametric modeling for information management of BIM models.
Costruzione di soliti platonici e sistemi voltati.
Software: **Rhinoceros. Dynamo for Revit**.

PLEASE NOTE: *many of the software that will be used during this course belong to Autodesk: from this year Autodesk requires a certificate of student status in order to grant the free license in educational mode, therefore all students are invited to regularize their enrollment as soon as possible.*

Course organization

The course uses the Sapienza e-learning system (http://elearning2.uniroma1.it/). The didactic relations will be managed through the Moodle platform https://elearning.uniroma1.it/course/view.php?id=11994, which allows students to take documents made available by the teacher, to talk each other in discussion groups, to upload documents to be verified, etc. All lessons will always be available to the student: live lessons will be recorded on Google Meet platform and the google drive link will be communicated to follow the lessons even after hours. Participation during live hours is not mandatory but strongly recommended, especially for the possibility of interacting directly with the teacher.