



Visual Programming Language, AI, and Generative Design for Infrastructure-Building Information Modeling

Lecturer: Eng. **Mattia Intignano**, PhD



Duration: 18 CLOCK HOURS (3 CFU)

Learning Objectives

This course introduces doctoral students and researchers to the use of visual and text-based programming for infrastructure design in BIM. Methodologies and tools for automating processes, managing data, and improving interoperability between software will be explored. Starting with modeling a road infrastructure in Autodesk Civil 3D, integration with Dynamo will proceed, finally expanding the focus to open-source environments, languages such as Python, and open-BIM road project management tools such as Bonsai. Space will be given to reading and writing geospatial data, manipulating infrastructure objects, and producing replicable workflows. The approach will be hands-on, with concrete examples and commented code, to stimulate experimentation and problem solving on real cases. Goal: To train professionals capable of innovating the infrastructure BIM process through programming. Upon successful completion of the course, students will be issued with a certificate of accomplishment for the acquired skills. Attendees will receive a non-commercial student license for participation in this course. Attendees are required to install the software on their own computers.

Topics include:

- BIM for Infrastructure: Fundamentals and Road Modeling in Civil 3D.
- VPL for Civil 3D: Dynamo Basics.
- VPL for Civil 3D: Automations in C3D workflows.
- Data Management: VPL and Python to foster interoperability.
- Open BIM and Programming Infrastructure Objects.
- Advanced tools for I-BIM workflows: AI agents.

Class Schedule

Lecture 1	Thursday, January 25 th , 2028 (3-6 PM)
Lecture 2	Thursday, February 1 st , 2028 (3-6 PM)
Lecture 3	Thursday, February 8 th , 2028 (3-6 PM)
Lecture 4	Thursday, February 15 th , 2028 (3-6 PM)
Lecture 5	Thursday, February 22 nd , 2028 (3-6 PM)
Lecture 6	Thursday, February 29 th , 2028 (3-6 PM)