

Spatial Interoperability for 3D Architectural Heritage Documentation: HBIM & GIS integration

THIRD LEVEL COURSE

PhD Programme in **Architectural Heritage**
Course Catalogue 2025/2026

Course Code
01WEJUO

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20 April – 11 May 2026
Sala Mollino

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The course introduces PhD students to the advanced use of geomatics technologies for the documentation and management of architectural and urban heritage. In particular, it addresses the methods and tools for 2D and 3D spatial representation of cultural and built heritage, focusing on the integration between GIS (Geographic Information Systems/Sciences) and HBIM (Heritage/Historical Building Information Modelling) and related standards for geographic information, GeoDatabase, 3D City Models and WebGIS platforms. An overview of the main international standards for geographic information and architectural documentation, which are essential for ensuring the interoperability of multi-scale and multi-source data, is also supplied. In addition to this, aspects related to geospatial data sources (open data, OpenStreetMap, institutional databases) and GeoDatabase design are explored in detail. Lastly, some examples of workflows and software for the definition of 3D GIS, HBIM-GIS integration and webGIS publication are shown.

TOPICS

- Fundamentals of geomatics for cultural heritage (and related standards for spatial and semantic documentation; e.g. CIDOC CRM, Getty Vocabularies);
- An overview of integrated 3D metric surveying techniques;
- GIS and Geodatabase: definition and structuring of spatial GeoDBs (from conceptual model to internal model) and publication of a WebGIS;
- Geographic information standards (CityGML, INSPIRE, IFC);
- GIS/HBIM integration for multi-scale documentation;
- 3D City Models;
- Open and public sources: OSM, geoportals, institutional databases;
- Interoperability between platforms (examples of workflows for managing GIS/BIM interoperability).

PROGRAMME

Lunedì 20 aprile 2026, 9.00 a.m. – 01 p.m.

Module 1 – *From 3D metric survey to Point Cloud*

Lunedì 27 aprile 2026, 9.00 a.m. – 01 p.m.

Module 2 – *GIS and Standards: Towards GeoBIM*
Guest lecture by Francesca Noardo of OGC

Giovedì 30 aprile 2026, 9.00 a.m. – 01 p.m.

Module 3 – *GIS-HBIM Integration Workflows*

Lunedì 4 maggio 2026, 9.00 a.m. – 01 p.m.

Module 4 – *Scan-to-BIM and Decision-Making*
Team Based Learning

Lunedì 11 maggio 2026, 9.00 a.m. – 01 p.m.

Module 5 – *Final Presentations*

Group presentations: “From survey to HBIM-GIS integration”

