SCAN2HBIM - From 3D Survey to BIM for Cultural Heritage

Virtual component: 15-30 September 2026 | Physical mobility: 25-29 September 2026, Pescara (Italy)

The programme gives priority to the theoretical and practical foundations of 3D survey, photogrammetry, laser scanning, point-cloud processing and three-dimensional BIM/HBIM modelling. The virtual component prepares the international teams and the survey/modelling strategy before arrival, supports collaboration during the on-site phase, and concludes with a short online follow-up. The field campaign is scheduled for 27 September; BIM/HBIM modelling in Revit or Archicad starts on 28 September after the acquired datasets have been checked, registered and prepared.

Complete blended calendar (virtual + physical)

Date / time	Mode	Activity	Main contents / expected output
Tue 15 Sep | 16:00-17:30	Online	BIP kick-off, case study and international team formation	Presentation of SCAN2HBIM objectives, learning outcomes, heritage case study, expected outputs and working methods. Formation of international teams and introduction to the complete survey-to-HBIM workflow.
Fri 18 Sep | 16:00-18:00	Online	Online lecture - 3D survey planning for cultural heritage	Survey purposes and information requirements; accuracy, resolution and scale; reference systems and control; acquisition strategies for photogrammetry and laser scanning; field metadata and quality-control principles.
Tue 22 Sep | 16:00-18:00	Online	Online lecture/workshop - From images and scans to point clouds	Photogrammetric image networks, terrestrial/mobile laser scanning, registration, georeferencing, cleaning and quality assessment. Discussion of sample datasets and possible contributions from partner lecturers.
Thu 24 Sep | 16:00-17:30	Online	Pre-field technical briefing and survey strategy	Final preparation for the on-site activity: software and data checks, team roles, survey plan, equipment, control points, field logs, safety/access issues and definition of the modelling strategy to be used after acquisition.
Fri 25 Sep - Tue 29 Sep	Pescara, in person	Physical mobility - lectures, laboratories, field survey and HBIM modelling	Five-day intensive programme detailed below. Strong focus on 3D survey theory and practice, full-day field campaign on 27 September, 3D data processing on 28 September and BIM/HBIM modelling in Revit or Archicad from 28 September onward.
Wed 30 Sep | 16:00-17:30	Online	Final follow-up, feedback and coordination of outputs	Short presentations of preliminary results, discussion of survey and modelling issues, peer feedback, assessment guidance and coordination of the final digital dossier and dissemination activities.

All times for online sessions are indicative and refer to Central European Summer Time (CEST). The detailed online links and speakers will be circulated to consortium partners before each session.

Time	Session / format	Main contents and expected output
DAY 1 - Friday, 25 September 2026 | Survey concepts, requirements and photogrammetry		
Fri 25 Sep 09:00-09:45	**Opening, case study and scan-to-HBIM workflow**	Welcome, team formation, presentation of the heritage asset, expected outputs and overview of the workflow from survey planning to the final HBIM model.
Fri 25 Sep 09:45-11:15	**Lecture 1 - Planning a 3D survey for cultural heritage**	Purposes of documentation; survey and information requirements; scale, accuracy, resolution and level of detail; reference systems, control points, metadata, accessibility and risk assessment.
Fri 25 Sep 11:30-13:00	**Lecture 2 - Close-range and terrestrial photogrammetry**	Image formation, camera calibration, overlap, baselines, exposure and lighting; acquisition networks for facades, interiors and complex details; sources of error and quality indicators.
Fri 25 Sep 14:00-15:30	**Demonstration - Cameras, targets and acquisition protocols**	Camera and lens settings, coded targets, scale bars, GNSS/topographic support, image logs and field checklists. Comparison of terrestrial, pole-based and, where permitted, UAV acquisition.
Fri 25 Sep 15:45-17:30	**Practical laboratory - Survey design and image-quality assessment**	Teams prepare a photogrammetric acquisition plan, test image sets, identify weak geometry or insufficient overlap and define the data and metadata to be collected during the field campaign.
DAY 2 - Saturday, 26 September 2026 | Laser scanning, point clouds and data quality		
Sat 26 Sep 09:00-10:30	**Lecture 3 - Terrestrial, mobile and SLAM laser scanning**	Measurement principles, range and incidence angle, resolution and noise; scan-position planning, targets, loop closure, indoor/outdoor integration and selection of the appropriate sensor for heritage assets.

Time	Session / format	Main contents and expected output
Sat 26 Sep 10:45-12:30	**Lecture 4 - Registration, georeferencing and uncertainty**	Target-based and cloud-to-cloud registration; control networks and coordinate systems; residuals, error propagation, completeness and accuracy reporting; integrating photogrammetric and laser-scanning datasets.
Sat 26 Sep 13:30-15:00	**Equipment demonstration - From setup to field validation**	Instrument setup, levelling and calibration checks; scan density and photographic capture; station planning; target distribution; rapid checks for shadows, occlusions, movement and reflective surfaces.
Sat 26 Sep 15:15-17:30	**Practical laboratory - Point-cloud processing and field strategy**	Import, registration, filtering, cleaning, subsampling, segmentation and basic measurements on a sample dataset. Teams finalise roles, station/image plans, control points and quality-control procedures for the field day.
DAY 3 - Sunday, 27 September 2026 | Full-day field survey of the selected heritage asset		
Sun 27 Sep 08:30-09:00	**On-site briefing and team deployment**	Safety and access briefing, final inspection of equipment, assignment of roles, synchronisation of field logs and confirmation of coordinate/control strategy.
Sun 27 Sep 09:00-12:30	**Field survey - Acquisition session I**	Photogrammetric image acquisition and terrestrial/mobile laser scanning; establishment and measurement of targets/control points; acquisition of general geometry, facades, interiors and circulation spaces.
Sun 27 Sep 13:30-16:30	**Field survey - Acquisition session II**	Completion of coverage, targeted acquisition of architectural details and areas affected by occlusion, supplementary measurements and condition/conservation documentation linked to the survey.
Sun 27 Sep 16:30-17:30	**On-site completeness check, backup and debrief**	Rapid alignment and image review, scan-coverage and density checks, verification of control observations, structured backup of raw data and metadata, and approval of the dataset for processing.
DAY 4 - Monday, 28 September 2026 | 3D data processing and start of BIM/HBIM modelling		
Mon 28 Sep 09:00-10:30	**Laboratory - Data organisation and quality control**	Folder structure, naming conventions, metadata and backups; integrity checks; image selection; scan inspection; identification of missing data, noise and acquisition problems.
Mon 28 Sep 10:45-12:30	**Laboratory - Photogrammetric and point-cloud processing**	Image alignment, dense reconstruction and/or scan registration; georeferencing, merging, cleaning and controlled subsampling; generation of reference products such as meshes, orthophotos, sections and unified point clouds.
Mon 28 Sep 13:30-14:30	**Lecture 5 - From reality-based data to an HBIM model**	Modelling objectives, level of information need, tolerances and simplification; segmentation and interpretation of heritage geometry; traceability of assumptions; native BIM elements versus custom parametric objects.
Mon 28 Sep 14:30-15:15	**Software demonstration - Revit or Archicad workflow**	Project setup, shared coordinates, units, levels and grids; import/linking of point clouds and reference products; views, clipping, sections and team-working organisation.
Mon 28 Sep 15:30-17:30	**BIM/HBIM laboratory I - Model setup and primary geometry**	Each team starts the model in Revit or Archicad, defines the reference system and creates the principal architectural elements from the registered survey dataset.
DAY 5 - Tuesday, 29 September 2026 | Advanced 3D/HBIM modelling, enrichment and validation		
Tue 29 Sep 09:00-10:30	**Lecture 6 - Modelling complex and irregular heritage geometry**	Walls with variable thickness, vaults, arches, roofs, openings and decorative components; custom families/objects, profiles and adaptive strategies; mesh/NURBS-to-BIM decisions and preservation of measurable evidence.
Tue 29 Sep 10:45-12:30	**BIM/HBIM laboratory II - Detailed modelling**	Continuation of the Revit or Archicad model, creation of complex elements and reusable parametric components, and coordination of the work produced by different team members.
Tue 29 Sep 13:30-14:30	**Lecture 7 - Semantic enrichment and interoperability**	Association of historical, material, typological and conservation information; classification and property sets; sources and reliability; links to photographs and documents; IFC exchange and openBIM considerations.
Tue 29 Sep 14:30-16:00	**BIM/HBIM laboratory III - Enrichment and model validation**	Addition of agreed information, comparison between model and point cloud, dimensional/deviation checks, review of modelling tolerances, production of plans, sections, axonometries and a concise model report.
Tue 29 Sep 16:15-17:15	**Team presentations and peer review**	Presentation of the survey strategy, processed 3D data, modelling choices, HBIM results, limitations and proposed uses for documentation, conservation and management.

Time	Session / format	Main contents and expected output
Tue 29 Sep 17:15-17:30	**Assessment, feedback and closing**	Assessment, in-person feedback and closing. Final instructions for the online follow-up session on 30 September and for completion of the digital dossier.

Indicative blended component and learner workload (15-30 September 2026)

Phase	Activities	Hours
Virtual component - 15 to 24 September	Synchronous kick-off, online lectures/workshops, team formation and pre-field technical briefing; asynchronous introductory materials; software/data preparation; review of the case study and preliminary survey/modelling strategy.	15
Physical mobility - 25 to 29 September	Lectures, demonstrations, practical laboratories, full-day field survey, 3D-data processing, Revit/Archicad modelling, validation, presentations and peer review as detailed above.	36
Individual/group project work - 15 to 30 September	Guided teamwork and independent refinement of survey records, registered datasets and HBIM model; preparation of the technical/digital dossier and supporting drawings/views.	21
Virtual follow-up - 30 September	Online presentation of preliminary outputs, peer feedback, assessment guidance, reflection and coordination of final submissions/dissemination.	3
Total indicative workload	Equivalent workload supporting the award of 3 ECTS credits.	75

Expected joint outputs: survey plan and field records; organised raw dataset and metadata; registered/georeferenced point cloud and photogrammetric reference products; BIM/HBIM model developed in Revit or Archicad; model-validation notes; drawings/views and final team presentation.

Note: The timetable is provisional and may be adjusted to the selected heritage asset, access conditions, weather, available sensors, software licences and participants' prior experience. Equivalent indoor datasets and exercises will be available as a contingency.