CHEK
DIGITAL BUILDING PERMIT

DIGITAL TRANSFORMATION IN BUILDING PERMITS

Advanced GeoBIM practices and the CHEK framework

ADVANCED SUMMER COURSE

7-11 JULY 2025

VN GAIA and GUIMARÃES, PORTUGAL

CHEKDBP.EU/ASC

ABOUT THE COURSE

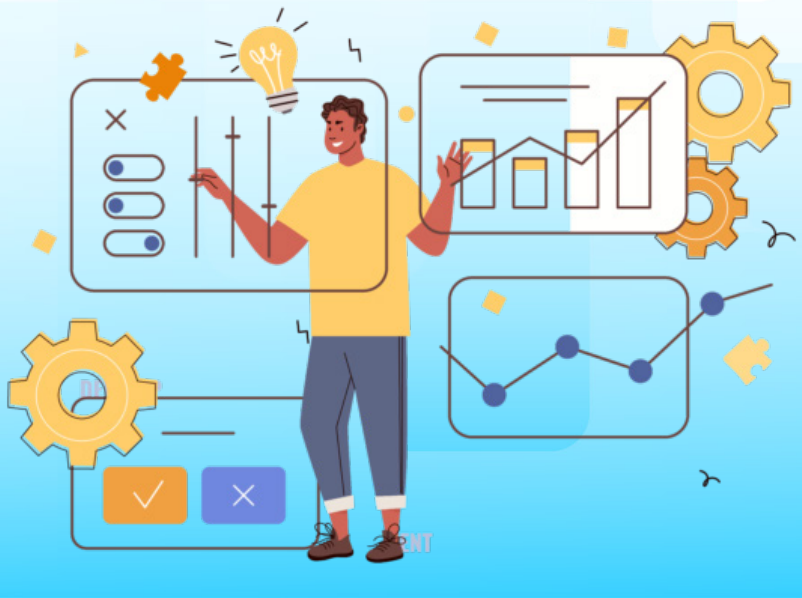
Digital Transformation in Building Permits: Advanced Practices and the CHEK Framework is an intensive one-week summer course designed to equip participants with cutting-edge knowledge and practical skills in the digitalization of building permit processes. Equivalent to 5 ECTS credits, this course delves into advanced topics such as BIM standardization, interoperability, GIS integration, legal frameworks, and the application of tools developed in the CHEK Digital Building Permits Project. Participants will engage with leading experts from the Academia and Industry, gaining insights into the latest developments and practices in the field.

FOR WHOM

This course is tailored for Civil Engineers and Architects engaged in research (e.g., PhD students) or working at an advanced level in the industry. It is ideal for professionals seeking to deepen their understanding of digital building permits, BIM technologies, and the integration of legal regulations with digital tools. Participants should have a foundational knowledge of BIM and an interest in the digital transformation of building permit processes.

OBJECTIVES

- Understand Digital Building Permits: Explore the evolution, current state, and standards (e.g., ISO 19560) driving the digital transformation of building permits.
- Master Technical Tools: Gain expertise in BIM interoperability, GIS, CityGML, and the Digital City Register for managing spatial and urban data.
- Analyze Legal Frameworks: Understand and interpret building permit laws and regulations in the context of digital workflows.
- Integrate Law and Technology: Learn how legal principles and digital technologies converge to enable automated digital building permit processes.
- Apply CHEK Tools: Use practical examples and software tools from the CHEK project to address challenges in digital building permits.



MINIMUM REQUIREMENTS

BSc degree in Architecture or Civil Engineering or equivalent

PARTICIPATION FEE

Registration is free, conditional to a deposit which is fully reimbursed upon attendance. In case no-show, the deposit is by default non-refundable.
The deposit fee is 150€.

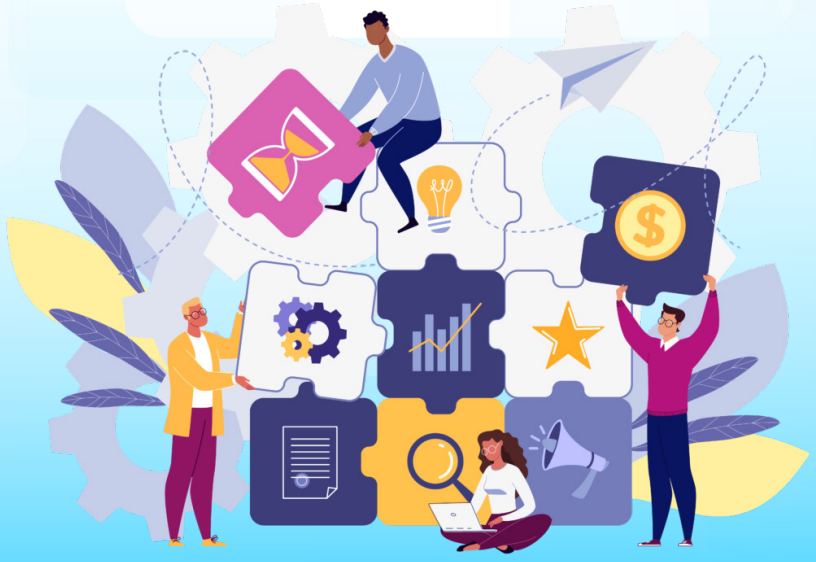
Lodging, transport and meals are not included.

APLICATIONS

Applications are made through the website -> chekdbp.eu/asc

The applications shall be submitted up to 30th March 2025.

Upon the received applications, the selection committee (composed by the teaching staff) will communicate to the selected applicants the need to pay the deposit to secure the participation. Deadline for deposit submission will be informed by email to participants.



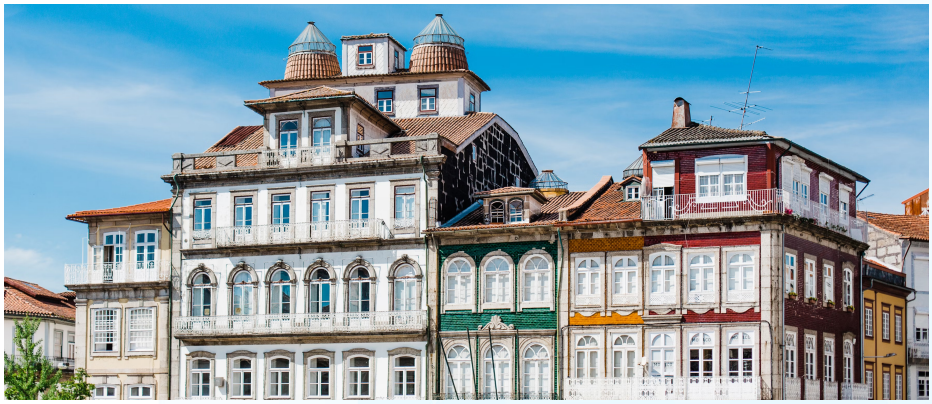
CALENDAR

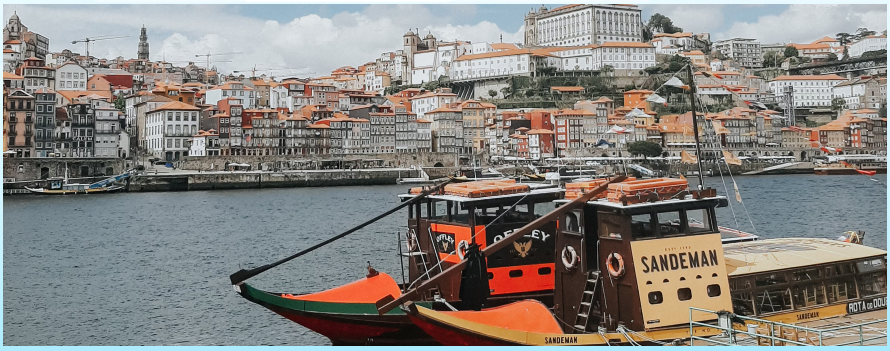
Day	Module	Venue
07/07	M1 - Introduction and State of the Art on Building Permits M2 - BIM standardization	GAIURB
08/07	M3 - Interoperability, openBIM and IFC M4 - Interoperability beyond IFC	Univ. of Minho
09/07	M5 - 3D city modelling: background and standards M6 - Creation of 3D city models and GeoBIM integration	Univ. of Minho
10/07	M7 - Building Permits Law M8 - Interpretation of Regulations: workshop	Univ. of Minho
11/07	M9 - Integration of CHEK DBP Process and Digital Technologies for DBP Automation M10 - Tools and practical examples of CHEK DBP	Univ. of Minho

VENUE

University of Minho
Campus de Couros
Guimarães
PORTUGAL

Universidade do Minho





GAIURB
Largo de Aljubarrota 13
Vila Nova de Gaia
PORTUGAL

GAIURB.EM
URBANISMO E HABITAÇÃO

TEACHING STAFF

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GAIURB

Patrícia Baptista
GAIURB

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MODULES

Module 1

Introduction and State of the Art on Building Permits

This module introduces the CHEK project and its role in advancing digital building permit (DBP) processes. It presents key research works on DBP, offering insights into current challenges and innovations. A visit to a building permit department will provide practical exposure to real-world workflows. Additionally, the module explores the state of the art of digital building permits, highlighting its trends and developments in several countries.

Module 2

BIM standardization

This module provides an overview of the standards related to the implementation of BIM. It covers ISO 7817 (Level of Information Need), ISO 23386 and ISO 23387 (Product Data Templates), and ISO 12006-2 (Classification Systems). Additionally, it explores ISO 19560, detailing concepts, principles, and processes for managing information throughout the asset lifecycle, from requirements definition to the delivery phase.

Module 3

Interoperability, openBIM and IFC

This module introduces advanced topics on interoperability, focusing on the role of OpenBIM and buildingSMART in enabling seamless data exchange through the development of open formats. It covers different types of BIM tools, the importance of interoperability, and the principles of OpenBIM. A deep dive into IFC (Industry Foundation Classes) explores its history, schema, file structure, and key elements. Practical aspects include georeferencing in IFC, coordinate reference systems, and techniques for analyzing IFC files using viewers and text editors.

MODULES

Module 4

Interoperability beyond IFC

This module provides a structured understanding of information exchange in BIM, focusing on Model View Definitions (MVD), Information Delivery Specifications (IDS), the buildingSMART Data Dictionary (bsDD), and the BIM Collaboration Format (BCF). It explores how these concepts facilitate interoperability and structured data exchange. Practical insights include defining IDS, exploring bsDD, using BCF for communication, and managing information in a CDE.

Module 5

3D city modelling: background and standards

The module aims to explain how cities are modelled in 3D. The first part of the module contains an overview of the relevant background concepts and methods, mainly covering topics from 2D and 3D GIS, such as the representation of geometry, topology and semantics, georeferencing and projections, and a sample of processing techniques and software. The second part of the module provides a technical overview of 3D city modelling, including concepts such as semantic surfaces and templates, and concretely how different classes of objects are modelled according to the standards that are used for it.

Module 6

Creation of 3D city models and GeoBIM integration

The module explains how 3D city models can be created and processed, as well as how they can be integrated with BIM models. The first part of the module covers some methodologies that can be used to jointly process and merge different typical 2D datasets to create a 3D city model, including a demonstration of 3dfier using 2D topographic data and a point cloud. The second part discusses the theoretical and practical aspects behind GIS and BIM integration (GeoBIM), including relevant concepts from integration and interoperability, as well as the conversion from Geo to BIM and vice versa.

MODULES

Module 7

Building Permits Law

The aim of the module is to have an overview of Public Administration processes and to know a methodology for interpreting regulatory regulations. The speech will focus on legal reflections on the issue of automation of decision-making processes of the Public Administration in the European legal framework. The exhibition will have an in-depth look at the use of building information modelling and artificial intelligence. A manual methodology for analysing regulations and identifying information requirements is proposed. Using labelling, objects and properties are defined, then standardized according to widely used BIM and GIS standards.

Module 8

Interpretation of Regulations: workshop

The workshop aims to teach a methodology for analyzing regulations to define information requirements and verification logic. Participants will identify elements required in building and city models and apply a labeling approach to structure data from regulations in tabular form. The session also introduces OpenAI tools, covering GPT customization, prompt design, and automating regulation analysis. Through hands-on exercises and demonstrations, attendees will test AI performance, reflect on challenges, and explore next steps, gaining skills to apply AI-driven solutions in regulatory contexts.

Module 9

Integration of CHEK DBP Process and Digital Technologies for DBP Automation

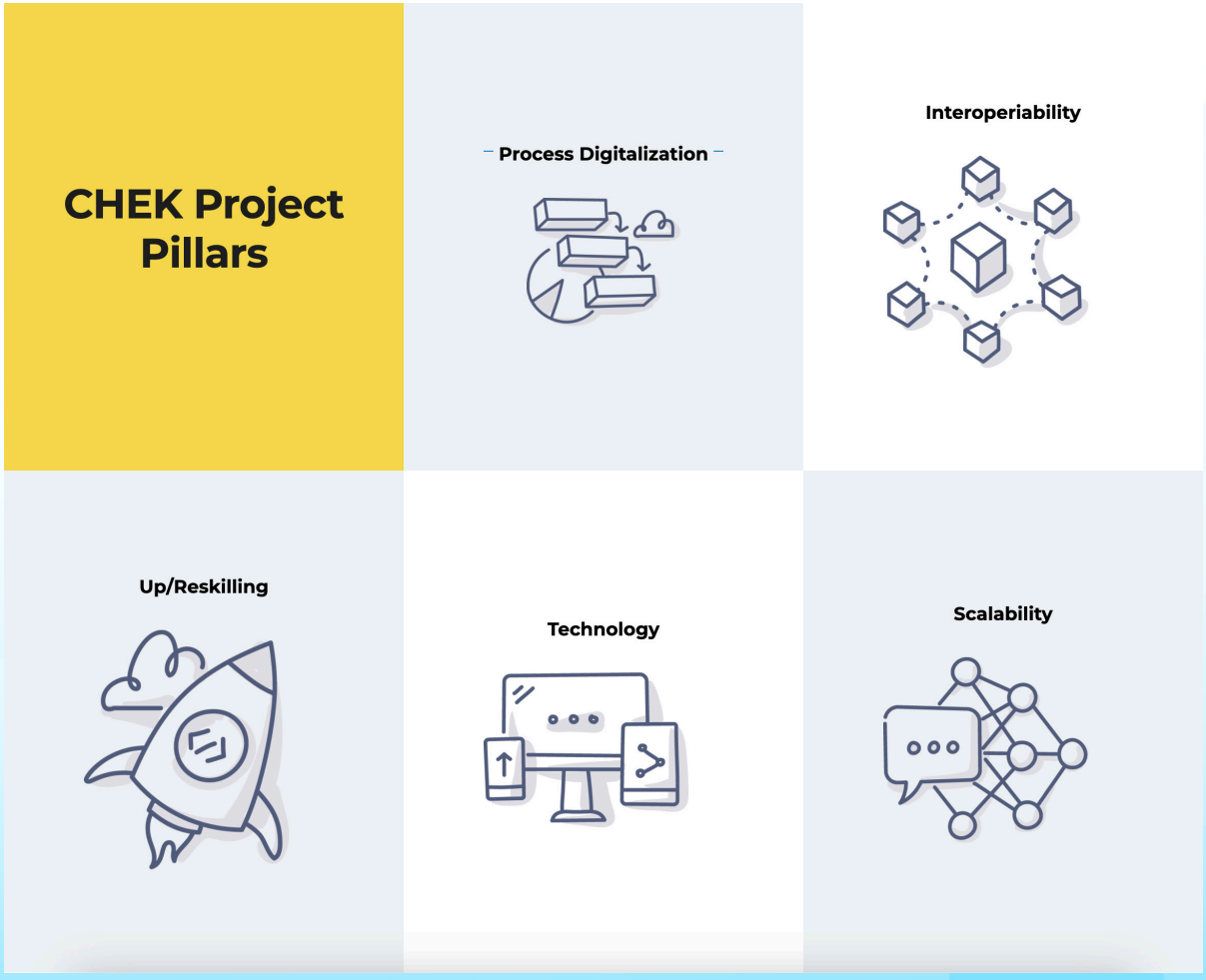
This advanced module explores the CHEK project's integration of process mapping and digital tools to transform building permit workflows. Participants analyze "as-is" processes through municipal workshops, identifying inefficiencies and bottlenecks, then design optimized "to-be" systems with BIM/GIS interoperability, automated rule-checking, visual inspection platforms, and digital signatures. The project's modular digital infrastructure supports scalability, compliance, and centralized data management, guided by KPIs like transparency and efficiency. A hands-on workshop enables attendees to create tailored "to-be" process maps, applying these tools to minimize delays, reduce errors, and adapt solutions to regional regulations. Emphasizing user-friendliness for municipalities and applicants, the module equips learners to drive efficient, transparent, and scalable permit systems.

MODULES

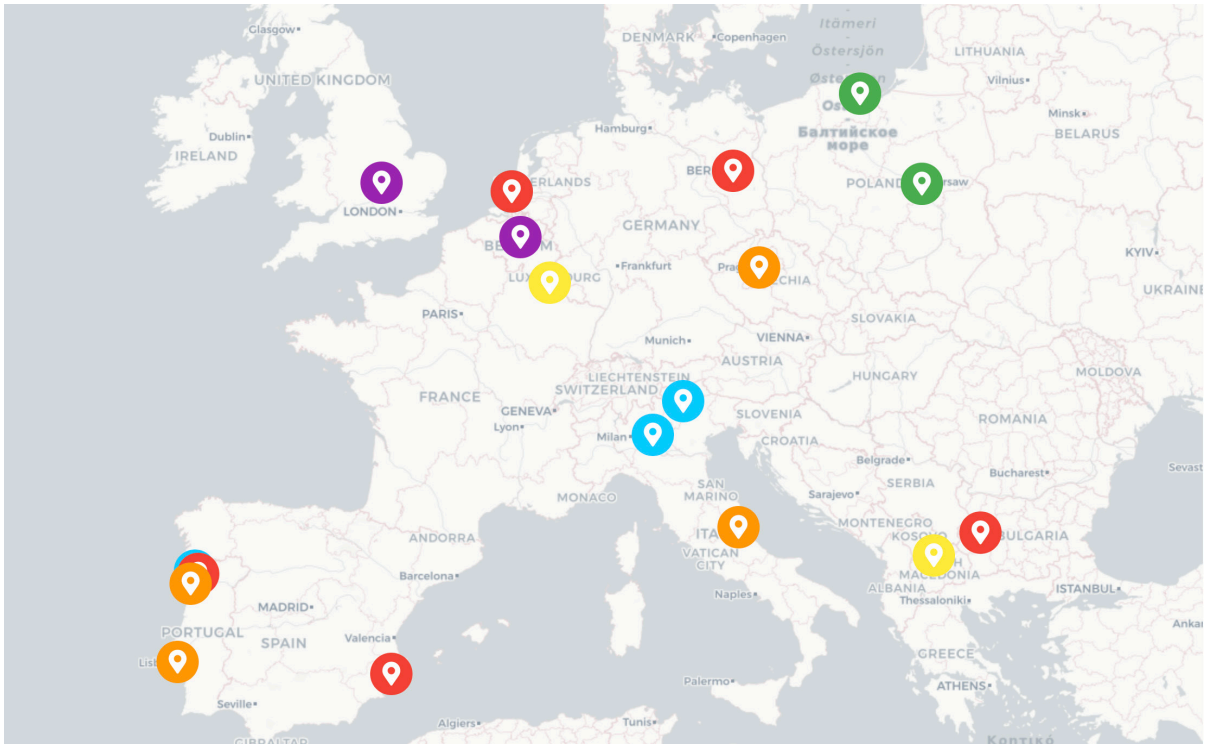
Module 10

Tools and practical examples of CHEK DBP

During this session an overview of CHEK tools and workflow will be provided. After this general overview, some of the tools will be explained in depth.
The objective of the initial overview is to take a look to all the tools that are relevant for de Digital Building Permit, not all these tools will be explained in depth as we don't have the time to do so (IFC Checkers, CityGML Checks, IDS Exporters,
In the second part we will put emphasis in three aspects: the DBP management platform both for designers and municipalities, site and architecture models and we will finalize with different types of checking tools that are portrayed in the project.
The session will have practical examples that will be accessible and provided to the students.
The idea is to explain and provide access to students to the tools but not for the students to use the tools live during the session.



PARTNERS OF CHEK



RESEARCH	SOFTWARE	DESIGN	CONSTRUCTION	MUNICIPALITIES	STANDARDIZATION
TU Delft 3Dgeoinfo	cype	SIA architects	Mostostal Warszawa	LISBOA Câmara Municipal	Open Geospatial Consortium
Fraunhofer Italia	virtual city systems	zwei Architektur.Design	FASADA	GAIURB.EM	buildingSMART International
University of Brescia	Xinaps			IPR Prague	
Universidade do Minho	RDF			Comune di Ascoli Piceno	
	DiRoots connecting the dots				