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Ref. Ares(2025)10497599 - 01/12/2025

D2.5 REPORT ON DEFINING SUBJECT CONTENT

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Building BIM digital competences

101183239 – BIM4WB – ERASMUS- EDU-2024-CB-VET

BIM4WB

Co-funded by the European Union

PROJECT INFO

Project title	Building BIM digital competences
Project acronym	BIM4WB
Project reference number	101183239
Funding scheme	Lump sum grant - ERASMUS- EDU-2024-CB-VET
Web address	https://bim4wb-eu.org/
Coordination institution	IES RIBEIRA DO LOURO
Project duration	36 months

The project aims to design and develop a Building Information Modeling (BIM) curriculum and training materials, focusing on innovating teaching and learning through learner-centered and real problem-based approaches. It includes the training of teaching staff to acquire new practical skills and the establishment of the BIM4WB platform, a user-friendly online resource for sharing knowledge, resources, and best practices related to BIM. The project targets enrolling at least 40 students/professionals in the training course and involves at least 15 teaching staff in personal and professional development skills training. It seeks to align academic offerings with the labor market to enhance student employability, with curriculum content reviewed by stakeholders to ensure it meets industry standards. Bim4WB is co-funded by the Erasmus+ Programme of the European Union during the period January 2025 – December 2027

PROJECT PARTNERS:

1. **IES RIBEIRA DO LOURO**
2. **BALIKESIR UNIVERSITY**
3. **EUROPEAN UNIVERSITY OF TIRANA**
4. **QENDRA PROTIK**
5. **UNIVERSUM INTERNATIONAL COLLEGE**
6. **AGENCY FOR VOCATIONAL EDUCATION AND TRAINING AND ADULT EDUCATION**

DOCUMENT CONTROL SHEET

Work package	WP2
Ref. no and title of activity	D 2.5
Title of deliverable	Defining subject content
Lead institution	UNI-Universum International College
Author(s)	Albiona Sopi
Document status	Final
Document version and date	v.02 – 25.06.2025

DELIVERABLE EXECUTIVE SUMMARY

This deliverable stands as a report from the workshop which brought together all project partners on the 13th of June 2025 to collaboratively identify and outline the core competencies and skills that are crucial for professionals in the BIM sector. Selection of BIM modules was drafted. This workshop was organized online.

VERSIONING AND CONTRIBUTION HISTORY

Version	Date	Revision description	Revision description
v.01	20.06.2025		
v.02	25.06.2025	Annex	

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EXECUTIVE SUMMARY

This deliverable has been prepared based on the outputs of the "Workshop on Defining Subject Content Regarding BIM," held on 13 June 2025. The workshop focused on the development of a Building Information Modeling (BIM) curriculum tailored to the contexts of Kosovo and Albania, in response to the current limitations in BIM adoption in both countries.

As agreed, the team from Balikesir University presented an overview of the existing BIM capacity and introduced a set of proposed modules for the BIM4WB project. The curriculum aim is defined as to establish a structured approach to BIM education, progressing from theoretical foundations to practical applications.

Participants provided feedback on different aspects starting with curriculum design, advocating for a more hands-on approach by reducing the volume of theoretical content to better engage students and professionals. Additional recommendations included introducing the curriculum with 2D fundamentals before advancing to 3D modeling, reinforcing the importance of foundational competencies. The group also discussed possible module restructuring to better align with the needs of educational institutions while maintaining a balance between theory and practice. The discussion and recommendations given further developed the curriculum.

Key questions explored during the session included:

- What adjustments can be made to better balance theoretical and practical components?
- Should the curriculum differentiate between medium and higher vocational education levels?
- How can the curriculum be adapted to suit both VET students and professionals?

Overview of BIM Curriculum Development for Kosovo and Albania

The Balikesir University team presented an overview on key needs, gaps, and priorities for developing a structured, practice-oriented BIM curriculum content tailored to the local context from two foundational studies—D2.2: Research on the Needs of the Industry and D2.3: Seminars with Industry Stakeholders—as well as their integrated synthesis in D2.4: BIM4WB – Report with the Outcomes of the Research and the Seminars from Kosovo and Albania. The BIM maturity levels were assessed for both countries, noting their classification as emerging adopters with limited formal frameworks. The need for a comprehensive BIM framework to facilitate a change in mindset and improve BIM adoption in the region was highlighted.

Table 1 below represents the current situation of both countries from a BIM adoption perspective

Table 1 Current Situation in Kosova and Albania

	Kosovo	**Albania**	**Remarks**
Strategic Framework	No	No	No formal national strategy documents or policy papers observed.
Legislation	No	No	No binding legislation; pilot attempts are rare or informal.
Industry Adoption	Moderate	Moderate	Isolated use of Revit/ArchiCAD in architectural offices; no systemic use.
Education& Training	Emerging	Emerging	Initial curriculum development is underway, often project-based.
Software Infrastructure	Limited	Limited	Educational licenses are available, but limited institutional access.

Process Maturity	Level 0-1	Level 0-1	Basic model-based workflows exist, but no collaborative or integrated practices.

Curriculum Overview and Module Breakdown

Based on the current situation in Kosovo and Albania regarding BIM, the team of Balikesir University first outlined a curriculum consisting of ten modules, categorized by theoretical, practical and combined content. The initial four modules presented were focusing on theoretical aspects, while practical applications beginning in Module 5. Each module included a course description, content, assessment methods, and learning objectives, which were still evolving.

Table 2 briefly presents the titles and contents of the 10 modules in the proposed curriculum.

Table 2: The titles and contents of the 10 modules in the proposed curriculum

Module	Module Title	Key Topics Covered	
1	Introduction to BIM & Digital Construction	History and evolution of BIM, principles, dimensions (3D, 4D, 5D, 6D), benefits for construction sector	2 hours (*theoretical*)
2	BIM Standards & Regulations	ISO 19650, EU and national BIM guidelines (Albania/Kosovo), legal compliance	2 hours (*theoretical*)
3	BIM Software & Tools Overview	Revit, ArchiCAD, Navisworks, BIM 360, Autodesk Docs, and open BIM standards (IFC)	4 hours (*theoretical*)
4	BIM Processes & Workflows	Common Data Environment (CDE), collaborative workflows, model coordination, clash detection	2 hours (*theoretical*)
5	BIM for Design Phase (3D)	3D modeling, parametric design, design validation, and visualization techniques	24 hours (*practical*)
6	BIM for Construction Phase (4D)	4D scheduling, construction simulation, site logistics using BIM	8 hours (*theoretical, practical*)
7	BIM for Cost Estimation (5D BIM)	Quantity take-offs, cost management, linking models with cost data	2 hours (*theoretical, practical*)
8	BIM for Facility Management & Sustainability(6D,7D)	Asset management, lifecycle data management, integrating BIM with FM systems	4 hours (*theoretical, practical*)
9	Advanced BIM Applications	AI/ML in BIM, point cloud integration, digital twins, GIS-BIM integration	2 hours (*theoretical*)

10	BIM Project Case Study	Practical implementation – students work on a BIM project, applying learned skills and presenting outputs	10 hours (*practical*)

Following the discussions regarding curriculum development for VET, one of the participants raised concerns about the curriculum's focus on theoretical content, advocating for a shift towards more practical, hands-on training to cater to both students and professionals. The concern was responded positively, suggesting that the team could integrate practical elements into the initial modules. Other participants supported this idea.

Course Hours

The discussion further followed on course hours, with the attention on the 60 hours allocated for the course based on a curriculum that spans approximately 14 weeks. Participants raised concerns about the adequacy of this time, particularly due to the steep learning curve associated with BIM software. It was suggested that the focus be more on 3D content, potentially reducing hours in other areas to accommodate this.

Curriculum Development for Vocational Education and Training in BIM

On the topic of curriculum development participants sought clarification on the curriculum's suitability for medium and higher vocational education levels, prompting the team from Balikesir University to explain the distinctions between these levels. It was highlighted that the necessity of incorporating theoretical knowledge alongside practical applications stands to ensure effective learning. Other suggestions pointed out merging theoretical and practical components to enhance engagement, while concerns were raised about differentiating the curriculum for various educational levels.

Further, the whole team addressed the curriculum's suitability for associate degree students, suggesting that while the core documents could be replicated, the titles may need to be updated. One participant pointed out that the curriculum is more complex than anticipated and is not intended for high school students. Other participant contributed by discussing the levels of qualifications in vocational education and training, suggesting that the modules presented could align better with levels 4 and 5.

Participants focused on discussing that developing a curriculum for the BIM4WB project will have the objective of being inclusive of various educational levels. The suggestions were on lowering the difficulty to include vocational and higher education students. The team agreed to consult with other partners to ensure the curriculum is practical and feasible within the given timeframe.

Following the workshop, the team from Balikesir University proposed the new curriculum presented below.

Updated curriculum

Based on workshop feedback, the Balikesir University team revised the proposed curriculum. The updated version includes five streamlined modules and a capstone case study to reflect the full BIM lifecycle and integrate stakeholder recommendations. Table 3 briefly presents the titles and contents of the modules in the new proposed curriculum.

Table 3 The titles and contents of the 5 modules in the proposed curriculum

Module	**Module Title**	**Key Topics Covered**	
1	Introduction to BIM & Digital Construction	History and evolution of BIM, principles, dimensions (2D, 3D, 4D, 5D), benefits for construction sector	4 hours (*theoretical*)
	BIM Standards & Regulations	ISO 19650, EU and national BIM guidelines (Albania/Kosovo), legal compliance	
	BIM Processes & Workflows	Common Data Environment (CDE), collaborative workflows, model coordination (BIM 360, Autodesk Docs)	
2	Design Phase (2D)	2D CAD drafting (AutoCAD)	16 hours (*practical*)
3	BIM for Design Phase (3D)	3D modeling, parametric design, design validation, and visualization techniques (Revit)	36 hours (*practical*)
4	BIM for Construction Phase (4D)	4D scheduling, construction simulation, site logistics using BIM (Navisworks)	10 hours (*theoretical, practical*)
5	BIM for Cost Estimation (5D BIM)	Quantity take-offs, cost management, linking models with cost data (Revit, Navisworks)	4 hours (*theoretical, practical*)

	BIM Project Case Study	Practical implementation – students work on a BIM project, applying learned skills and presenting outputs	10 hours (*practical*)

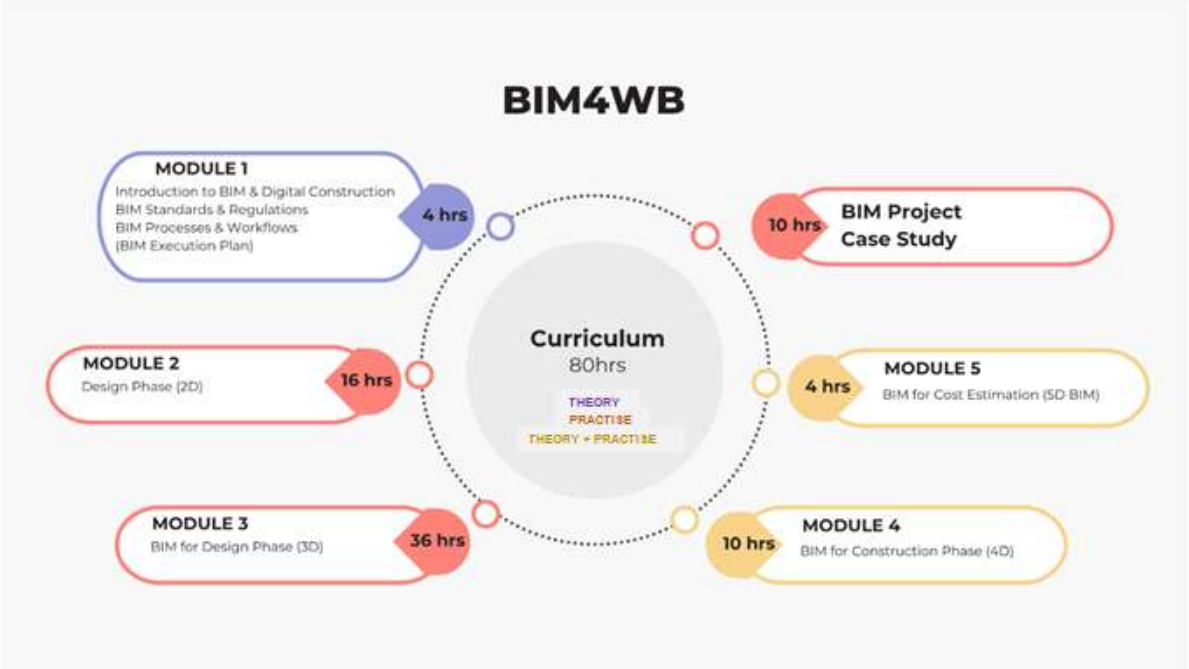


Figure 1. Balance of Theory and Practice Across Modules

Conclusions

The workshop held on 13th June brought together all project partners for a productive and collaborative discussion on the development of curriculum modules. Participants emphasized the importance of building on existing resources and leveraging partner expertise to co-develop specialized modules—particularly in advanced areas such as AI in BIM—ensuring the curriculum remains both practical and adaptable for future needs.

The group underscored the need to strike a balance between theoretical knowledge and hands-on skills, especially within vocational education settings. As a direct outcome of the workshop discussions, the project partners reached consensus on several key adjustments to the BIM curriculum. The initial proposal, which consisted of ten modules, was revised to better reflect stakeholder feedback and practical implementation needs.

One major decision was to place stronger emphasis on practical content from the outset. Participants agreed that the original curriculum was too theory-heavy in the early stages, which could discourage learner engagement—particularly among vocational education and training (VET) students. As a result, practical components were integrated into earlier modules, and the sequencing was adjusted to begin with 2D drafting fundamentals before advancing to 3D modeling and more complex BIM applications.

Another important decision involved the curriculum's adaptability to different education levels. Finally, the team agreed that the revised curriculum should serve as a flexible framework, allowing partner institutions in Kosovo and Albania to adapt the content according to their own institutional and regional contexts. This includes ensuring alignment with local labor market needs and supporting broader goals of digital transformation and workforce development in the construction and architecture sectors.

These outcomes demonstrate a shared commitment to building a robust, future-oriented BIM curriculum aligned with the objectives of the BIM4WB project.

Annex

MODULE 1			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	2 hrs	-	Introduction to BIM & Digital Construction
Lesson Information			
Course Description	This module presents the concept of Building Information Modelling (BIM) methodology, its basic concepts such as history and development of BIM, principles, dimensions (3D, 4D, 5D, 6D), benefits for the construction industry.		
Course Content	•What is BIM •BIM: Challenges and Potential •History and evolution of BIM •Principles, dimensions (3D, 4D, 5D, 6D, 7D) •Benefits for construction sector		
Assessment Method	Online quizzes, discussion forums.		
Recommended or Required Reading			
Learning objectives			
	To provide information about the history and development process of BIM.		
	To explain the basic principles and dimensions of BIM (3D, 4D, 5D, 6D).		
	To evaluate the areas of use of BIM in the construction industry and the advantages it provides.		
	Discuss the differences and transformational effects of BIM compared to traditional methods.		
	Understand the role of BIM in the project life cycle (design, construction, operation).		
Learning Outcomes			
	Defines the concept of BIM and explains its role in digital construction processes.		
	Understands the historical development of BIM and describes its important milestones.		
	Explains the basic principles of BIM (e.g. collaboration, information sharing, object-oriented, modeling).		
	Explains the dimensions of BIM (3D, 4D, 5D, 6D, etc.) and shows the contributions of each dimension to the construction process with examples.		

MODULE 2			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	2 hrs	-	BIM Standards & Regulations
Lesson Information			
Course Description	This module addresses the possibilities of applying the BIM methodology in the construction sector and public procurement. It also describes the guidelines and stages of information exchange processes to be carried out in the context of BIM use in the construction sector.		
Course Content	•ISO 19650, •EU and national BIM guidelines (Albania/Kosovo), •Legal compliance.		
Assessment Method	Online quizzes, discussion forums.		
Recommended or Required Reading			
Learning objectives			
	Understand the role and potential of BIM methodology in the construction sector and public procurement,		
	Understand the strategic, technical and legislative framework regarding the use of BIM in public projects,		
	Explain the information exchange processes, stages and relevant standards in BIM projects,		
	Interpret information management within the framework of national and international BIM standards (e.g. ISO 19650),		
	Analyze successful application examples regarding the use of BIM in the public sector.		
Learning Outcomes			
	To get acquainted with and understands the elements of the BIM implementation process.		
	To be able to recognize and apply the BIM methodology in the construction sector and public procurement.		
	To understand and learn to determine the main guidelines of information exchange processes in the application process of the BIM methodology and to carry out their stages.		

MODULE 3			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	6 hrs	-	BIM Software & Tools Overview
Lesson Information			
Course Description	This module aims to recognize the different types of software used in the construction sector and to be able to correctly select software solutions that can be used at different stages of the BIM life cycle.		
Course Content	•Introduction (Building Information Modeling compatible programs: Revit, ArchiCAD, Navisworks, BIM 360, Autodesk Docs, and open BIM standards), •Architectural software solutions, •Construction software solutions, •MEP (Mechanical, electrical, and plumbing) software solutions.		
Assessment Method	Online quizzes, discussion forums.		
Recommended or Required Reading			
Learning objectives			
	Recognize the basic software types used in the construction and architecture sector (CAD, BIM, analysis, simulation, project management, etc.),		
	Understand what types of software solutions are used at each stage of the BIM process,		
	Analyze the functions, capabilities and interoperability features of different software,		
	Understand the opportunities offered by BIM platforms in terms of integration and information sharing.		
Learning Outcomes			
	To recognize and adapt different types of software used in the construction sector at different stages of the BIM life cycle.		
	To learn to recognize and determine the basic criteria for preparation for the implementation of the BIM methodology.		
	To recognize and use the coordination and quality criteria of project information models.		

MODULE 4			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	2 hrs	-	BIM Processes & Workflows (BIM Execution Plan)
Lesson Information			
Course Description	The main purpose of this module is to know what BIM processes and workflows (BIM Execution Plan-BEP) are, what they are used for and how to prepare them.		
Course Content	•BIM Execution Plan overview ▪ What is the BIM Execution Plan ▪ Why is the BIM Execution Plan done ▪ BIM Execution Plan components •Project information ▪ BIM Execution Plan timelin ▪ Key project contacts ▪ BIM roles and responsibilities ▪ BIM use staffing •Project BIM Goals and BIM Uses ▪ Major BIM Goals / Objectives ▪ BIM Uses ▪ Organizational Roles / Staffing •BIM exchange protocol and submittal format •Electronic communications and BIM data requirement format •Collaboration Procedures •Model content requirements		
Assessment Method	Online quizzes, discussion forums.		
Recommended or Required Reading			
Learning objectives			
	Understand the general structure of BIM processes and how they work throughout the project life cycle,		
	Learn the concept and purpose of the BIM Execution Plan (BEP),		
	Understand in what situations, by whom and how BEP is prepared,		
	Recognize the basic components and information that should be included in BEP,		
	Develop or analyze a practical BEP draft.		
Learning Outcomes			
	To develop a BIM Execution Plan in the architecture, engineering and/or construction industries.		
	To explain the guidelines and stages of information exchange processes to be carried out in BIM applications in the construction sector.		

MODULE 5			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	-	24 hrs	BIM for Design Phase (3D)
Lesson Information			
Course Description	This module aims to process the concept of “information modeling with BIM software” and provide practical training with the software used in Building Information Modeling.		
Course Content	•Basic Modeling Concepts •Modeling concept •Software interface •Conceptual modeling and preliminary analysis •Architectural modeling •Wall design and placement •Door and window design and placement •Roof design and placement •Building documentation, plans, sections and elevations •Staircases and railings •Space definition and legends •Structural modeling •Carrier elements •Reinforcement modeling - Autodesk® Revit - Tekla® Structures relationship •Mechanical modeling •HVAC subsystem elements •Plumbing system		
Assessment Method	Final capstone project, module-based assignments		
Recommended or Required Reading			
Learning objectives			
	To experience the concept of BIM at a software level and understand what information modeling means,		
	To acquire basic modeling skills using BIM software (e.g. Autodesk Revit, ArchiCAD, Allplan etc.),		
	To learn the processes of creating, editing and associating model elements in BIM software in a practical way,		
	To use tools such as view, section, quantity take-off, sheet production effectively in BIM software,		
	To be able to read and analyze the interdisciplinary integration of the model and data content.		
Learning Outcomes			
	To understand basic modeling concepts and the requirements of Building Information Modeling-based modeling.		
	To understand the interfaces, functions of modeling tools and the processes required for preliminary preparation for modeling.		
	To understand how to model a building with various building elements from architectural, structural, mechanical, electrical and plumbing systems.		

MODULE 6			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	-	2 hrs	BIM for Construction Phase(4D)
Lesson Information			
Department / Program			
Course Description	This module aims to first present basic analysis concepts and then provide practical training on how to analyze a building with a completed Building Information model with different tools in different contexts.		
Course Content	•Analysis concept •Building Information Modeling for Construction Sites •Model integration and management •Clash Analysis •Problem detection and solving •Planning and 4D simulation		
Assessment Method	Final capstone project, module-based assignments		
Recommended or Required Reading			
Learning objectives			
	Understand the concept of analysis and the basic principles of performing analysis on a BIM model,		
	Understand how the BIM model is used for performance and decision support analysis,		
	Develop an overview of different types of analysis such as energy, daylight, structural, cost or time (4D/5D) analysis,		
	Learn the processes of integrating the BIM model into other software for analysis purposes,		
	Be able to perform basic analysis on a real BIM model		
Learning Outcomes			
	To understand basic analysis concepts.		
	To grasp analysis methods to be performed with BIM.		
	To produce an integrated information model by project stakeholders.		

MODULE 7			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	1 hrs	1 hrs	BIM for Cost Estimation (5D BIM)
Lesson Information			
Department / Program			
Course Description	The aim of this module is to determine more logical organization and economic planning for construction works according to the available resources.		
Course Content	•5D Construction Planning with Navisworks •Material quantity calculation and Cost estimation		
Assessment Method	Final capstone project, module-based assignments		
Recommended or Required Reading			
Learning objectives			
	Understand the types of resources in construction projects and the management principles of these resources,		
	Understand the relationship between time, cost and labor factors,		
	Be able to plan by using resources effectively and efficiently,		
	Learn how to evaluate and optimize projects economically.		
Learning Outcomes			
	To define economic planning for construction works.		
	To know and apply the principles of BIM methodology related to quantification of activities and construction works.		
	To be able to calculate the final budget by determining the price of each activity.		

MODULE 8			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	1 hrs	1 hrs	BIM for Facility Management & Sustainability(6D)
Lesson Information			
Department / Program			
Course Description	The aim of this module is to teach the basic principles of sustainable building design, introduce the use of energy simulation tools and provide knowledge and skills on calculating the operational carbon footprint.		
Course Content	•Sustainable building design processes, •Energy simulation programs, •Energy simulation and open-source standards, •Operational carbon footprint calculations.		
Assessment Method	Final capstone project, module-based assignments		
Recommended or Required Reading			
Learning objectives			
	Understand the basic principles and strategies of sustainable building design,		
	Learn the basic functions and intended uses of energy simulation tools,		
	Understand the concept of operational carbon footprint and be able to apply calculation methods,		
	Understand ways to evaluate and improve sustainable building performance.		
Learning Outcomes			
	To explain the basic principles of sustainable building design.		
	To define the working logic and application areas of energy simulation programs.		
	To perform simulations to evaluate building energy performance.		

MODULE 9			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
	2 hrs		Advanced BIM Applications
Lesson Information			
Course Description	The aim of this module is to ensure that students recognize digital tools and methods beyond BIM technology. Artificial intelligence and machine learning, dot cloud technology, digital twin concept and BIM integration by focusing on the integration of BIM, aims to learn students about data processing, analysis and integration.		
Course Content			
Assessment Method	Online quizzes, discussion forums.		
Recommended or Required Reading			
Learning objectives			
	To recognize the advanced applications of BIM and understand the basic logic of these technologies,		
	To comprehend how AI/ML algorithms will be integrated into BIM processes,		
	Learning the processes of transforming dot cloud data into BIM models by processing,		
	Explaining the concept of digital twin, application areas and system integrations,		
	To evaluate how GIS data will be integrated with BIM and the potential benefits of this integration.		
Learning Outcomes			
	Defines Advanced Applications of BIM and analyzes development trends.		
	Explain how AI/ML models are integrated into BIM processes and form scenarios.		
	It analyzes dot cloud data and uses software tools (eg recap, cloudCompare, revit) to produce BIM models from them.		
	Explains how digital twins work and evaluate how it is used in building operating and maintenance processes.		
	Explains the basic methods of GIS-BIM integration with examples.		

MODULE 10			
Course Unit Code	**Theoretical**	**Practice**	**Course Name**
		2 hrs	BIM Project Case Study
Lesson Information			
Department / Program			
Course Description	In this module, various discipline models (architecture, structure, mechanics, electricity, etc.) of a sample building project will be produced in line with the concepts explained in the first 9 modules, and various analyses (e.g. clash analyses, time simulations, exploration/quantity surveying, etc.) to be used in the construction process will be performed.		
Course Content	•Application of Building Information Modeling with a sample project •Production of a 3D architectural model •Production of discipline models using the architectural model as a base •Clash Analysis •Production of time planning with 4D models •Production of surveying-quantity surveying with 5D models, cost estimation •Production of cost estimation with 5D models		
Assessment Method	Final capstone project, module-based assignments		
Recommended or Required Reading			
Learning objectives			
	To be able to create BIM models of different disciplines (architecture, statics, mechanics, electricity) within the framework of the specified project,		
	To be able to create an interdisciplinary digital twin (federated model) by integrating these models in the BIM environment,		
	To be able to perform analyses related to the construction process (clash control, time simulation, estimation/quantity takeoff) through the project model,		
	To develop model-based coordination and collaboration skills,		
	To experience in practice how the BIM model contributes to project management, construction planning and cost calculations.		
Learning Outcomes			
	Production of architectural and engineering (structural system, mechanics, electricity, installation) models of a sample project using various BIM modeling tools.		
	Performance of clash analyses with analysis programs		
	Performance of cost calculation.		