Erasmus+

BLENDED INTENSIVE PROGRAM

Sustainable buildings and infrastructures

Instituto Politécnico de Viana do Castelo

PARTICIPATING PARTNERS

Coordinator/Receiving HEI:

Instituto Politécnico de Viana do Castelo
Rua Escola Industrial e Comercial de Nun'Álvares, n.º 34
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Organisation ID: E10203394

Partner/Sending HEIs:

OID	Erasmus code	Legal name	Country
E10208852	I ANCONA01	UNIVERSITA POLITECNICA DELLE MARCHE	Italy
E10174650	RO BACAU01	UNIVERSITATEA VASILE ALECSANDRI DIN BACAU	Romania
E10209056	PL BIALYST01	POLITECHNIKA BIALOSTOCKA	Poland

BIP GENERAL INFORMATION

BIP Title	Sustainable buildings and infrastructures
BIP Code	2024-1-PT01-KA131-HED-000224067-1
Dates for physical activity	09 fev. 2026 - 13 fev. 2026
Proposed period for virtual component	02 fev. 2026 - 06 fev. 2026
Location	School of Technology and Management, Viana do Castelo (Portugal)
Type of Participants	Students (bachelor, master, PhD) from the Partner Institutions (expected 5 -6 students per partner)
Field of Education	0732: Building and civil engineering
Project base learning activity	Problem Solving
Priorities addressed	Environment and fight against climate change
Number of ECTS	3 ECTS
Main teaching/training language	English
Objectives and description	The course explores the integration of environmental, economic, and social aspects in the development of sustainable structures, aimed at reducing environmental impact, improving energy efficiency, and enhancing the overall sustainability of urban environments. The course covers key topics such as green building standards, renewable energy integration, lifecycle assessments, and sustainable urban planning. Through a combination of theoretical knowledge and practical applications, students will learn how to address sustainability challenges in the built environment, including the optimization of resources, reduction of carbon emissions, and the enhancement of resilience to climate change. Objectives: ● Understand Sustainable Development Principles ● Analyze Environmental Impacts ● Learn Green Building Standards ● Explore Renewable Energy Integration ● Promote Energy Efficiency and Resource Optimization ● Apply Lifecycle Assessment (LCA) ● Foster Sustainable Urban Planning ● Develop Practical Sustainable Design Skills ● Address Climate Resilience and Adaptation

- Encourage Collaborative and Interdisciplinary Problem Solving

Teaching Methods

1) *Lectures:*

Core concepts related to sustainability in buildings and infrastructure will be presented through structured lectures. These will cover topics such as energy efficiency, sustainable materials, renewable energy, and green certifications (LEED, BREEAM, etc.).

2) *Case Studies:*

IPVC examples of sustainable building projects and infrastructure developments will be analyzed. This allows students to critically evaluate different approaches to sustainability and learn from successful projects worldwide.

3) *Workshops:*

Hands-on workshops will focus on applying theoretical concepts to practical design problems. Students will engage in collaborative activities, such as designing energy-efficient buildings or sustainable urban plans.

4) *Field Visits:*

Where possible, visits to green buildings or infrastructure projects will be organized, allowing students to observe sustainable construction practices and technologies in real-life settings.

5) *Group Discussions and Peer Learning:*

Interactive sessions will encourage students to discuss sustainability challenges and solutions, fostering peer learning and collaborative problem-solving.

Learning outcomes

1) *Comprehensive Understanding of Sustainability in Construction:*

Students will be able to explain the principles of sustainable development and their application in the construction of buildings and infrastructures. They will understand the relationship between construction activities and their environmental, economic, and social impacts.

2) *Ability to Analyze and Evaluate Sustainable Practices:*

Students will be able to critically assess buildings and infrastructure projects for sustainability using relevant frameworks and tools (e.g., lifecycle assessments, energy performance analysis). This includes

evaluating energy efficiency, carbon emissions, resource usage, and ecological impact.

3) *Knowledge of Green Building Standards:*

Students will gain a strong understanding of green building certifications (e.g., LEED, BREEAM) and will be able to interpret and apply these standards in the design and assessment of sustainable structures.

4) *Skills in Sustainable Design:*

By the end of the course, students will be able to design sustainable buildings and infrastructure, considering factors such as energy efficiency, use of renewable energy, sustainable materials, and climate adaptation strategies.

5) *Proficiency in Renewable Energy Integration:*

Students will be able to identify and integrate renewable energy technologies (solar, wind, geothermal) into building and infrastructure designs to improve energy efficiency and reduce carbon footprints.

6) *Lifecycle Assessment Skills:*

Students will be proficient in conducting lifecycle assessments (LCA) to measure the long-term environmental impact of materials and designs from production to disposal, ensuring more informed decisions about sustainability.

7) *Understanding of Climate Resilience:*

Students will learn to integrate climate resilience strategies into the design and operation of buildings and infrastructures, ensuring they are adaptable to climate change risks like extreme weather events and rising temperatures.

8) *Interdisciplinary Collaboration:*

Students will develop the ability to work effectively in interdisciplinary teams, combining knowledge from architecture, engineering, environmental science, and urban planning to solve sustainability challenges.

Methods and results

- Deep Understanding of Sustainability in the Built Environment
- Proficiency in Evaluating Environmental Impact
- Practical Skills in Sustainable Design

	• Ability to Apply Green Building Standards • Integration of Renewable Energy in Design • Lifecycle Assessment and Material Selection • Climate Resilience in Infrastructure Design • Collaborative and Interdisciplinary Approach
Virtual Component Description (20 hours)	The virtual component serves as the foundation of the course, offering students a flexible learning environment to acquire theoretical knowledge, engage in collaborative discussions, and work on group projects related to sustainable buildings and infrastructure. This component prepares students for the intensive physical mobility phase by introducing core concepts and methodologies. • Pre-recorded video lectures, supplemented by live Q&A sessions with instructors. • Weekly reading assignments and case study analysis. • Asynchronous discussion boards to encourage interaction among students from different backgrounds, fostering peer learning and exchange of ideas. Instructors will moderate discussions and provide feedback on student contributions. • Virtual teamwork using online collaboration tools (e.g., Google Docs or Microsoft Teams). • 5) Live, interactive workshops or webinars hosted by instructors and guest speakers.

PHYSICAL MOBILITY SCHEDULE (PROVISIONAL)

Intensive week with group dynamics, visits, and hands-on project work

Monday, february 9th, 2026: Arrival and Introduction

Morning

Arrival and Registration

Welcome Session: Orientation by the hosting university and introduction to the local culture, logistics, and safety protocols.

Afternoon

Campus/Facility Tour: Tour of the hosting university's campus, including any sustainability initiatives or infrastructure.

Ice-breaking Activity: Interactive session for students and staff to get to know each other.

Evening

Welcome Dinner: Networking event for students and faculty to meet in an informal setting.

Tuesday, february 10th, 2026: Sustainable Building Design and Green Certification

Morning

Lecture: "Green Building Standards and Certifications" (LEED, BREEAM, etc.)

Workshop: Group activity on designing an energy-efficient building using green building standards.

Afternoon

Case Study Analysis: Review of local sustainable building projects with a focus on green certification and energy efficiency.

Group Discussions: Collaborative discussion on the challenges of implementing green building standards in different regions.

Evening

Free time or optional city tour to explore local architecture.

Wednesday, february 11th, 2026: Field Visit to Sustainable Building or Infrastructure Project

Morning

Field Visit: Guided tour of a sustainable building, smart city project, or eco-friendly infrastructure project

On-site Lecture: Explanation of sustainability features, design challenges, and performance results by project engineers or architects.

Afternoon

Workshop on Site: Students will work in teams to assess the sustainability features of the project and propose improvements.

Evening

Group reflection on field visit and project outcomes.

Thursday, february 12th, 2026: Renewable Energy Integration and Urban Sustainability

Morning

Lecture: "Renewable Energy Integration in Buildings and Infrastructure"

Simulation Workshop: Hands-on session using software to model renewable energy systems (e.g., solar, wind) in building design.

Afternoon

Field Visit or Guest Lecture: Presentation from a local expert or visit to a renewable energy facility (solar farm, wind turbine site, etc.)

Group Work: Teams will begin developing a final project, applying lessons learned from the course to propose sustainable solutions for a hypothetical or real-world site.

Evening

Group project brainstorming and peer feedback session.

Friday, february 13th, 2026: Final Project Presentations and Closing Ceremony

Morning

Group Presentations: Each group presents its sustainable building or infrastructure design project, highlighting energy efficiency, material selection, and sustainability strategies.

Peer and Faculty Feedback: Discussion on each group's approach, followed by constructive feedback from peers and professors.

Afternoon

Closing Session: Summary of key takeaways from the mobility week, discussion on next steps for the virtual phase, and final thoughts from the instructors.

Certificate Award Ceremony: Distribution of certificates of participation.

Evening

Farewell Event: Informal gathering or dinner to conclude the program.

Throughout the week, students will engage in interdisciplinary teamwork and practical activities to complement the virtual component of the course.

Time is allocated for networking, cultural experiences, and reflection on sustainability practices in local contexts.

APLICATION PROCEDURE

How to apply?

Procedures for registration will be sent to selected and nominate students by home Universities to internacional@ipvc.pt

Places are limited to 25 participants and will be filled in strict order of registration.