STUDY ABROAD SCHEDULE 2026

	Itinerary 1		Itinerary 2	
Students	Civil Engineering		Civil Engineering and Architecture	
Subject 1	Geometric Design of the Railway Alignment	14 h	Introduction to urban forms' analysis	14 h
Subject 2	Groundwater modelling	14 h	Introduction to the analysis of structural typologies	14 h
Subject 3	Introduction to water supply systems	14 h	Introduction to the design of urban multimodal transportation hubs	14 h
Subject 4	Applications of drones and photogrammetry in Civil Engineering	12 h	BIM management and coordination	12 h
Subject 5	Introduction to AI-Based Image Creation and Digital Processing	6 h	Introduction to AI-Based Image Creation and Digital Processing	6 h
Field Trip	Hydrogeological tour to "Las Lagunas de Ruidera Natural Park" LINK 		Structural tour to "Toledo World Heritage city" LINK 	

Teaching hours per subject will be finalized after reviewing the technical content of each course. A tentative distribution of the teaching hours per subject is as follows:

- Subjects 1–3: 14 hours
- Subject 4: 12 h
- Subject 5: 6 hours

ITINERARY 1

SUBJECT 1: Geometric Design of the Railway Alignment

The ongoing modernization of the railway sector, and the commitment that European institutions are making toward this mode of transport, increasingly demands professionals capable of understanding its specific features, particularly those related to the geometric design of railway track alignment.

This situation justifies the need for specialized training, primarily aimed at civil engineers. The course sessions are structured to first examine the elements of the superstructure (rail, fastenings, sleepers, etc.) to then focus on the geometric design of the track layout (radii, transition curves, gradients, etc.). Finally, the course will review the design criteria recommended by current alignment standards and apply the concepts through a workshop in which the students will solve a practical case using a specific railway alignment software (Istram).

Course contents:

- Elements of the railway cross-section
- Rolling stock and its influence on alignment design
- Track alignment design parameters
- Horizontal and vertical alignment design
- Introduction to geometric railway design using the software Istram
- Design of railway junctions

SUBJECT 2: Groundwater modelling

Groundwater constitutes a key component of the hydrological cycle and plays a fundamental role in water resources management, environmental preservation, and civil engineering projects. Understanding the behaviour of aquifer systems is essential for engineers involved in water supply planning, infrastructure development, and environmental impact assessment, as groundwater processes directly influence surface water systems, soil behaviour, and long-term resource sustainability.

This course provides an introduction to groundwater modelling for civil engineers, combining fundamental hydrogeological concepts with practical numerical applications. The sessions are structured to first present the role of groundwater within the water cycle and the basic principles of hydrology, followed by the study of groundwater balance, recharge estimation, and the main physical properties of aquifers. Building on this theoretical background, students are introduced to the modelling of groundwater systems through applied case studies, allowing them to understand how numerical models can support analysis and decision-making in real engineering contexts. The learning process is reinforced through a modelling project and a field trip aimed at connecting theoretical concepts with direct observation of hydrogeological processes in real environments.

Course contents:

- Introduction and fundamentals of hydrology: groundwater within the water cycle
- Basic groundwater balance and estimation of recharge
- Fundamental properties of aquifers
- Groundwater system modelling applied to a real case study (Campo de Montiel aquifer)
- **Field trip: Hydrogeological visit to Las Lagunas de Ruidera**

SUBJECT 3: Introduction to water supply Systems

Water supply systems are essential infrastructures that guarantee public health, urban development, and the functioning of modern cities. Their planning and operation require engineers who understand both the physical processes involved in water distribution and the technical criteria used to design efficient and reliable networks. Within civil engineering, knowledge of water supply systems is fundamental for addressing challenges related to urban expansion, service resilience, and sustainable resource management.

This course provides an introduction to water supply systems, focusing on their role within urban infrastructure and on the fundamental principles governing their design and operation. The sessions are structured to first present the context and importance of water supply networks within the urban water cycle, followed by the study of their main components and basic design guidelines. Building on this foundation, the course introduces hydraulic modelling techniques as a tool to analyse system performance and support design decisions. Practical sessions will allow students to apply theoretical concepts through the use of EPANET software, enabling them to model and evaluate realistic distribution networks.

Course contents:

- Context: the role of water supply systems within the urban water cycle
- Design principles, components, and basic guidelines for water supply systems
- Hydraulic modelling and analysis using EPANET software
- Practical hydraulic exercises based on EPANET
- Group design project focused on the analysis and sizing of a realistic water distribution system

SUBJECT 4: Applications of drones and photogrammetry in Civil Engineering

Water supply systems are essential infrastructures that guarantee public health, urban development, and the functioning of modern cities. Their planning and operation require engineers who understand both the physical processes involved in water distribution and the technical criteria used to design efficient and reliable networks. Within civil engineering, knowledge of water supply systems is fundamental for addressing challenges related to urban expansion, service resilience, and sustainable resource management.

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- Design principles, components, and basic guidelines for water supply systems
- Hydraulic modelling and analysis using EPANET software
- Practical hydraulic exercises based on EPANET
- Group design project focused on the analysis and sizing of a realistic water distribution system

SUBJECT 5: Introduction to AI-Based Image Creation and Digital Processing

The rapid development of artificial intelligence tools for image generation and digital processing is opening new possibilities for visual communication and documentation in civil engineering and architecture. These technologies allow professionals to efficiently produce visual material that supports design processes, improve photographic documentation obtained during site inspections, and enhance the communication of technical information. As digital workflows become increasingly relevant in engineering practice, an introductory understanding of these tools is valuable for future professionals.

This course provides a practical introduction to Artificial Intelligence (AI)-driven tools for image creation and digital processing applied to engineering and architectural contexts. The sessions are structured to first present an overview of the main artificial intelligence tools currently available, introducing their capabilities and potential applications within professional workflows. Building on this foundation, students will learn how to generate visual content to support design ideas, enhance and edit photographs obtained during site visits or technical documentation tasks, and explore current trends in image-based digital representation. Rather than focusing on advanced technical development, the course emphasizes practical understanding and integration of these technologies into everyday engineering workflows.

Course contents:

- Overview of main AI tools
- AI-assisted image creation for design support and visual communication
- Basic prompting strategies and control of generated outputs
- Integration of AI-driven visual workflows into engineering and architectural practice

ITINERARY 1

First Week: June 8th – 12nd

Time	Monday 8	Tuesday 9	Wednesday 10	Thursday 11	Friday 12
9:00-11:00	Subject 1	Subject 1	Subject 1	Subject 1	
11:00-11:30	Break	Break	Break	Break	
11:30-13:30	Subject 2	Subject 2	Subject 2	Subject 2	
15:30-17:30	Spanish survival	Spanish survival	Spanish survival		

Second Week: June 15th – June 19th

Time	Monday 15	Tuesday 16	Wednesday 17	Thursday 18	Friday 19
9:00-11:00	Subject 1	Subject 1	Subject 1	ITINERARY TRIP	
11:00-11:30	Break	Break	Break		
11:30-13:30	Subject 2	Subject 2	Subject 2		
15:30-17:30					

Third Week: June 22th – June 26th

Time	Monday 22	Tuesday 23	Wednesday 24	Thursday 25	Friday 26
9:00-11:00	Subject 5	Subject 4	Subject 5	Subject 4	
11:00-11:30	Break	Break	Break	Break	
11:30-13:30	Subject 3	Subject 3	Subject 3	Subject 5	
15:30-17:30		Sports competition			

Fourth Week: June 29th – July 3h

Time	Monday 29	Tuesday 30	Wednesday 1	Thursday 2	Friday 3
9:00-11:00	Subject 4	Subject 4	Subject 4	Subject 4	
11:00-11:30	Break	Break	Break	Break	
11:30-13:30	Subject 3	Subject 3	Subject 3	Subject 3	
15:30-17:30		Sports competition		Farewell Dinner END OF THE PROGRAM	

ITINERARY 2

SUBJECT 1: Introduction to urban forms' analysis

The increasing complexity of contemporary cities and the growing challenges related to sustainability, mobility, and quality of urban life require professionals capable of understanding the structure and evolution of urban environments. In this context, the analysis of urban forms has become an essential tool for civil engineers and urban planners, as it allows the interpretation of how cities develop, function, and respond to current social and environmental demands.

This course introduces students to the analysis of urban forms and to the basic principles of urban design. The sessions are structured to first examine different urban typologies and the main debates associated with current urban issues, providing a critical framework to understand existing cities. Subsequently, the course addresses key concepts of urban design, focusing on public space, user needs, accessibility, traffic organization, and sustainability-oriented approaches. The learning process is reinforced through practical workshops in which students analyse real urban contexts and evaluate urban redesign proposals from a sustainability perspective.

Course contents:

- Introduction to the analysis of urban forms
- Analysis of different urban typologies and current urban debates
- Public space: functions, users, challenges, and qualities
- Basic design parameters: pedestrian accessibility and traffic (vehicles, bicycles, etc.)
- Sustainability and new trends in urban design
- Workshop 1: analysis of the urban forms of a city and its current problems
- Workshop 2: analysis of a sustainability-oriented urban redesign project

SUBJECT 2: Introduction to the analysis of structural typologies

Structural typologies such as beams, trusses, arches, and cable-supported systems constitute the fundamental families of structures used in civil engineering and architecture. Each typology is characterized by specific load-transfer mechanisms and by a close relationship between structural behaviour and geometric form. Understanding the role of form in directing the flow of forces is essential for developing structural intuition, allowing engineers to interpret how loads are transmitted and how structural efficiency emerges from geometry.

This course introduces students to the main structural typologies through a qualitative and quantitative approach focused on developing intuition rather than complex analytical procedures. Particular emphasis is placed on understanding load paths, identifying dominant structural actions, and using simplified calculations and order-of-magnitude estimations to evaluate the plausibility of numerical results. By connecting conceptual understanding with basic structural calculations, students learn to critically interpret computer-based models and avoid purely black-box use of software tools.

Course contents:

- Introduction to structural typologies and the relationship between form and structural behaviour
- Basic concepts of load paths, equilibrium, and structural efficiency
- Structural behaviour of beams, trusses, arches, and cable-supported systems
- Simplified structural analysis and order-of-magnitude estimation techniques
- Interpretation and critical assessment of numerical models
- Practical workshop: simplified analysis of an iconic structure and order-of-magnitude verification
- **Field Trip: Structural tour to the world Heritage city of Toledo**

SUBJECT 3: Introduction to the design of urban multimodal transportation hubs

Urban multimodal transportation hubs play a strategic role in contemporary cities, acting as critical nodes where different transport systems converge and interact. These infrastructures are not only technical facilities but also complex urban spaces that influence mobility patterns, accessibility, land use, and urban development. Understanding their spatial, functional, and operational logic is essential for designing efficient, inclusive, and sustainable mobility environments

This course introduces the principles underlying the planning and design of multimodal transport hubs from both an engineering and urban perspective. It examines how different transportation modes, including rail, metro, bus, cycling, and pedestrian networks, can be integrated within coherent spatial frameworks that prioritize connectivity, safety, and user experience. Particular attention is given to circulation schemes, passenger flows, accessibility, and the relationship between transport infrastructure and surrounding urban fabric. The course also addresses contemporary challenges such as sustainability, intermodality efficiency, public space quality, and the integration of digital mobility systems.

Course contents:

- Role of multimodal hubs within urban mobility systems
- Principles of intermodality and modal integration
- Passenger flow analysis and circulation design
- Accessibility and inclusive design in transport nodes
- Relationship between transport infrastructure and public space
- Sustainability and contemporary trends in mobility-oriented urban design
- Case study analysis and applied workshop

SUBJECT 4: BIM management and coordination

Building Information Modeling (BIM) has become a central methodology for the integrated design, coordination, and execution of engineering and architectural projects. Beyond geometric modelling, BIM enables structured information management and collaborative workflows that improve project efficiency, reduce errors, and support decision-making throughout the construction process. Understanding how to manage BIM information and coordinate multidisciplinary models is therefore essential for professionals working in digital construction environments.

This course provides a structured pathway from core BIM principles to practical model-based coordination workflows, including 3D coordination, 4D planning, and introductory 5D cost-oriented processes. The sessions are designed for students with prior experience in BIM modelling and focus on how well-organized models support interoperability, clash detection, scheduling, and quantity extraction. Through practical workflows using industry-standard software, students learn how to prepare models for coordination, review and manage conflicts, and link design information with construction planning and cost analysis.

Course contents:

- Introduction to BIM management principles and information workflows
- Model readiness, interoperability, and data preparation for coordination
- Model export, review, and coordination processes using Navisworks
- Clash detection and communication workflows for coordination meetings
- Introduction to 4D planning and visual simulation linked to construction schedules
- Basic 5D workflows: quantity extraction and cost-oriented model use
- Practical project development and final BIM deliverable preparation

SUBJECT 5: Introduction to AI-Based Image Creation and Digital Processing

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ITINERARY 2

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Time	Monday 8	Tuesday 9	Wednesday 10	Thursday 11	Friday 12
9:00-11:00	Subject 1	Subject 1	Subject 1	Subject 1	
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11:00-11:30	Break	Break	Break	Break	
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15:30-17:30		Sports competition			

Fourth Week: June 29th – July 3h

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9:00-11:00	Subject 3	Subject 3	Subject 3	Subject 3	
11:00-11:30	Break	Break	Break	Break	
11:30-13:30	Subject 4	Subject 4	Subject 4	Subject 4	
15:30-17:30		Sports competition		Farewell Dinner END OF THE PROGRAM	