ERASMUS+ BLENDED INTENSIVE PROGRAM (BIP)

Safety of underground transport infrastructure

General description

This **Erasmus+ Blended Intensive Programme** aims to develop a didactic approach to studying the safety of the infrastructure has to be ensured in order to achieve high availability. Underground transport infrastructure represents a special case in this context, as a confined space always comes along with special challenges. For this reason, an enormous effort has been spent to provide safe tunnels, car parks, etc. However, this topic is under-represented in European academic education. For this reason, this project initiative aims to close this gap and to provide a dedicated programme that focuses on the safety of underground transport infrastructure. The project team comprises experience in automotive-, energy- and civil engineering as well as in transport safety, thus, representing a unique unity that enables a holistic view of the topic.

Knowledge of relevant aspects in this context is indispensable for engineers of the future. There will be insights into:

- Operation and construction of underground infrastructure
- Safety aspects of tunnels and various types of vehicles
- Project development in an international and multidisciplinary group work
- Visit a real tunnel under construction near Wroclaw

BIP Partners and Teachers

- TU Darmstadt, Institute for Internal Combustion Engines and Powertrain Systems - Germany **(coordinator)**
  Disciplinary field: Engine and propulsion systems
  Patrick Noone, Bernard Lenzen, Lars Knaup
- WUST (Wrocław University of Science and Technology) – Poland
  Disciplinary field: Civil eng. aspects
  Maciej Sobotka, Jarosław Ryba
- PoliTO (Politecnico di Torino), Diparimento di Energia, Energy Center – Italy
  Disciplinary field: Energy Eng. aspects and road tunnel aspects
  Davide Papurello
- TU Graz (Technical University of Graz), Graz – Austria
  Disciplinary field: Engineering and Thermodynamic, Safety issues on road tunnels
  Daniel Fruhwirt

Language

The activity will be exclusively held in English.

Recipients

The BIP is primarily addressed to Master of Science degree students in the disciplinary areas of energy, mechanical, civil engineering. Bachelor's students can apply as well.

Students attending the BIP will have the unique opportunity to experience an integrated, interdisciplinary and international formation.

Maximum number of participants

30 from all the Unite! universities.

Credits

The programme is **3 ECTS credits worth**.

When

The BIP activities will take place between the 12th September and 27th September 2024. During the first week, there will be online lessons held by the universities TU Graz, PoliTO, WUST and TU Darmstadt. The second week will take place in Darmstadt where there will be the opportunity to meet all participants and work together. A field trip to Wroclaw (Poland) is included as part of the activities. More information is available on the Metacampus: https://metacampus.unite-university.eu/course/info.php?id=99

Fees and obligations

The programme does not require the payment of any fee and includes participation in all BIP activities. Participation in the programme can be funded through **Erasmus+ mobility grants**, contributing to cover travel, accommodation and meal costs.

Information for Politecnico di Torino students

Applications and deadlines

In order to apply, students have to send the local coordinator (davide.papurello@polito.it) an email with full name, PoliTO student number, the *Laurea* or *Laurea Magistrale* attended, the year of enrolment, and the intention to participate in the BIP.

In addition, students have to attach the following documents (in pdf format):

- Motivation letter (max 500 words) written in English;
- Curriculum Vitae, including the PoliTO passed exams and marks.

The application must be submitted by July 19th, 2024.
Further steps are detailed in the section "General Timeline & calendar" (see below).

Requirements

- Laurea in Ingegneria Energetica; Ingegneria Meccanica/Mechanical Engineering; Ingegneria Civile; Ingegneria per l'Ambiente e il Territorio, Ingegneria Chimica e Alimentare: 2nd or 3rd year completed during the academic year 2023/2024; obtain the *Laurea* not earlier than December 2024;
- Laurea Magistrale in Ingegneria Energetica e Nucleare; Ingegneria Meccanica/Mechanical Engineering; Ingegneria Civile/Civil Engineering; Ingegneria per l'Ambiente e il Territorio, Ingegneria Chimica e dei Processi Sostenibili: 1st or 2nd year completed during the academic year 2023/2024; obtain the *Laurea Magistrale* not earlier than December 2024;
- Participants must be enrolled for the academic year 2024/2025 before the starting date of BIP activities, virtual part included (see section "General timeline & calendar").

Selection

The applications gathered by the PoliTO local coordinator will be assessed by the BIP partners jointly, checking the eligibility of applicants with reference to the "Requirement" section above.

List of participants

An email will be sent to selected candidates on **July 25th, 2024**. The list will comprise up to 8 selected students + 2 eligible candidates (reserve list).
The selected students shall confirm participation according to the instructions contained in the email above.
If one of the 8 selected students cancels his/her participation in time, the first eligible candidate in the reserve list will take his/her place.
The consortium may decide to select further participants in case of extra places available. in this case, they will receive an email with relevant instructions.

Erasmus+ scholarship

Upon completing the selection procedures, PoliTO International Mobility Unit will receive the official list of participants. The International Mobility Unit will contact them about the allocation of Erasmus+ scholarships.

Credit recognition

All participants must complete a Learning Agreement that will guarantee credit recognition (instructions will be sent by the International Mobility Unit).
The 3 ECTS credits will be automatically recognized as *EXTRACURRICULARI*, in addition to the number of credits required to complete the *Laurea* or *Laurea Magistrale* path, upon completion of all the BIP activities (both virtual and in-presence).

DISCLAIMER

The organization is NOT accountable if the activity is cancelled for any *force majeure* reason.

For any information and/or clarification request, please email the local activity coordinator (davide.papurello@polito.it).

General timeline & calendar

Selection Process

19th July 2024	**Deadline for students' application**
25th July 2024	Notification of the results (1st round)
29th July 2024	Notification of the results (2nd round) – if needed
2nd August 2024	Finalisation of the list of Participants

Schedule

Scheduled programme draft

Time	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	12-Sep-2024	13-Sep-2024	14-Sep-2024	15-Sep-2024	16-Sep-2024	17-Sep-2024	18-Sep-2024	19-Sep-2024	20-Sep-2024	21-Sep-2024	22-Sep-2024	23-Sep-2024	24-Sep-2024	25-Sep-2024	26-Sep-2024	27-Sep-2024
9:00-10:00	Online Welcome Event											City Tour in Darmstadt "Darmstadt at a glance"	Group work: Project development	Group work: Project development		On-sight Visit near Wroclaw
10:00-11:00	Online Lesson: Introduction, operation and construction	Online Lesson: Legislation			Online Lesson: Safety aspects of alternative propulsion systems & new energy carriers	Online Lesson: Basics about electromechanical installations	Study & Preparation									
11:00-12:00												Lunch Break	Lunch Break	Lunch Break		Lunch Break
12:00-13:00								Group work: Project development								
13:00-14:00														Group Presentation		
14:00-15:00	Online Lesson: Safety aspects I	Online Lesson: Safety aspects II	---	---	Online Lesson: Case studies: rail & road	Study & Preparation	Exam		Travel to Darmstadt	Sightseeing	Sightseeing	Group work: Project development	Group work: Project development		Travel from Darmstadt to Wroclaw	Individual Return or Sightseeing / Dinner in Wroclaw and return on Saturday
15:00-16:00																
16:00-17:00	Study & Preparation	Study & Preparation				Q & A Session	Introduction to Group Project							Spare Time / Sightseeing		
17:00-18:00																
18:00-19:00												Visit of Schlossgarten with Tutor International	Spare Time / Sightseeing			
19:00-20:00																

- Online lessons (Introduction, Safety aspects, Legislation, Basics of electromechanical installations, case studies) 20 h;
- Group works and project development.