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EUCEET 2025: European Civil Engineering Education and Training Association

Bridging Innovation and Resilience Through the Norisk Erasmus Mundus Program in European Civil Infrastructure Education

ECIU European University

EUCEET Association

Műegyetem 1782 BME

NORISK

Risk Assessment and Management of Civil Infrastructures

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Why an international master on risk assessment and management?

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Is there a need?

my.europe EUROPE NEWS

European infrastructure is 'vulnerable' and needs greater protection, says EU commissioner

COMMENTS

By **Sandor Zsiros** • Updated: 03/10/2022

REUTERS

ESG ENVIRONMENT FEBRUARY 25, 2020 / 4:56 PM / UPDATED 3 YEARS AGO

Europe's infrastructure at "high risk" from climate change: U.N. study

By Emma Farge

EU infrastructure risk project to address potential climate, 'resource' shortage catastrophes

Atos-led group to protect European infrastructure from impact of future pandemics – using Horizon cash

Dan Robinson Tue 24 Jan 2023 // 11:47 UTC

Awareness

the European Un

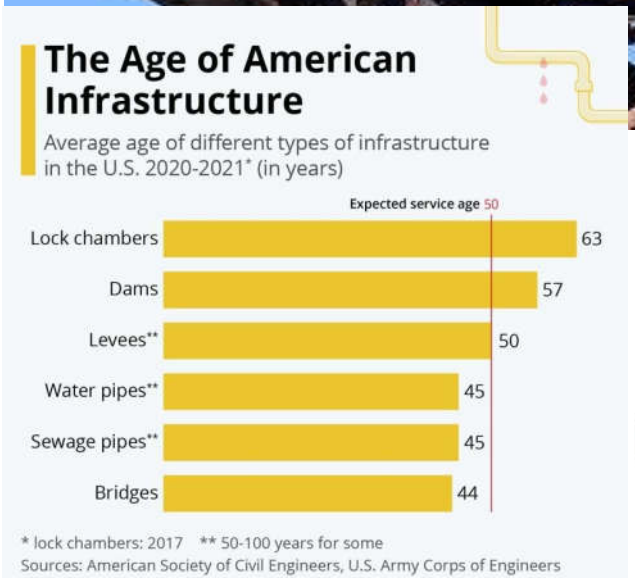
Home / News / Technology / EU Commission seeks accelerated defence of critical infrastructure

EU Commission seeks accelerated defence of critical infrastructure

By Molly Killeen | EURACTIV.com Oct 18, 2022 (updated: Oct 20, 2022)

Advertisement

Is there a need?



Durability

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Source: EC, Energy, Climate change, Environment, 2024

Extreme weather Events

60% rise in the cost of damage from extreme weather events across Europe estimated over a 30-year period. Europe's infrastructures have the largest contribution to monetary damages (European Academies' Science Advisory Council).

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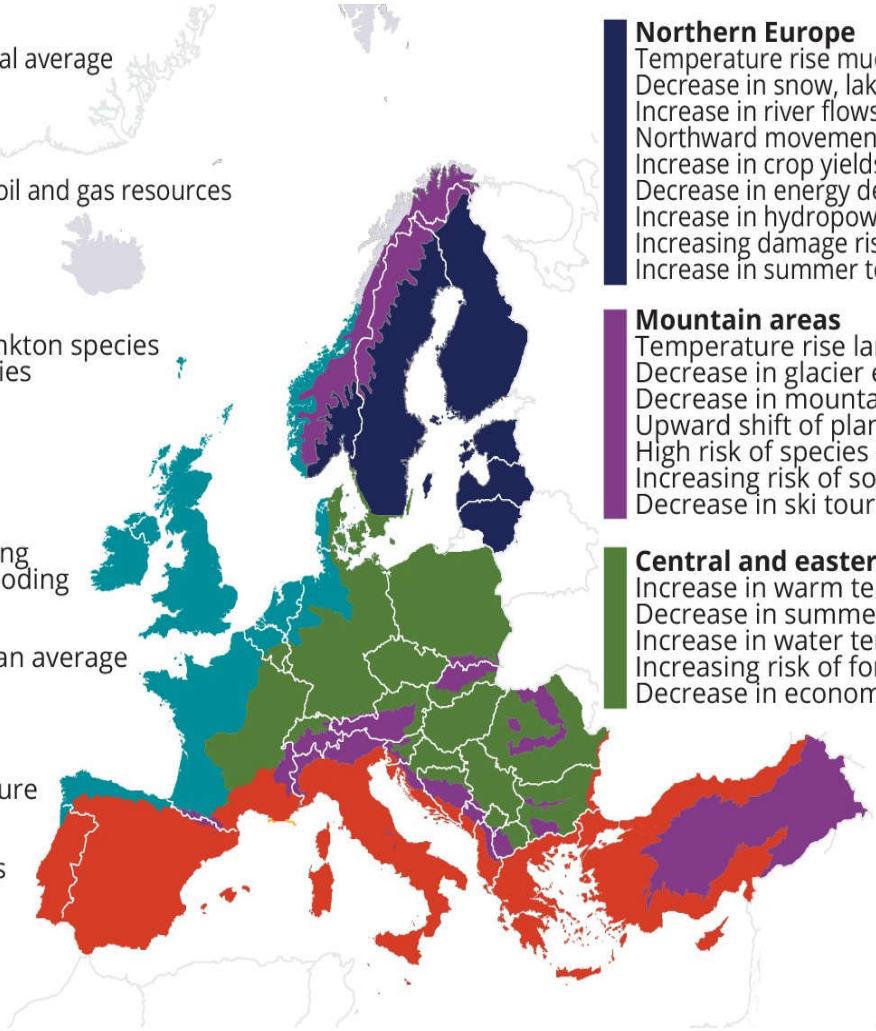
Climate change

Arctic
Temperature rise much larger than global average
Decrease in Arctic sea ice coverage
Decrease in Greenland ice sheet
Decrease in permafrost areas
Increasing risk of biodiversity loss
Intensified shipping and exploitation of oil and gas resources

Coastal zones and regional seas
Sea-level rise
Increase in sea surface temperatures
Increase in ocean acidity
Northward expansion of fish and plankton species
Changes in phytoplankton communities
Increasing risk for fish stocks

North-western Europe
Increase in winter precipitation
Increase in river flow
Northward movement of species
Decrease in energy demand for heating
Increasing risk of river and coastal flooding

Mediterranean region
Temperature rise larger than European average
Decrease in annual precipitation
Decrease in annual river flow
Increasing risk of biodiversity loss
Increasing risk of desertification
Increasing water demand for agriculture
Decrease in crop yields
Increasing risk of forest fire
Increase in mortality from heat waves
Expansion of habitats for southern disease vectors
Decrease in hydropower potential
Decrease in summer tourism and potential increase in other seasons



Northern Europe
Temperature rise much larger than global average
Decrease in snow, lake and river ice cover
Increase in river flows
Northward movement of species
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increasing damage risk from winter storms
Increase in summer tourism

Mountain areas
Temperature rise larger than European average
Decrease in glacier extent and volume
Decrease in mountain permafrost areas
Upward shift of plant and animal species
High risk of species extinction in Alpine regions
Increasing risk of soil erosion
Decrease in ski tourism

Central and eastern Europe
Increase in warm temperature extremes
Decrease in summer precipitation
Increase in water temperature
Increasing risk of forest fire
Decrease in economic value of forests

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- Damage from heat waves, droughts in southern Europe, and coastal floods shows the most dramatic rise, but the risks of inland flooding, windstorms, and forest fires will also increase in all Europe, with varying degrees of change across regions.

- Damages to 'critical infrastructures' in the EU+ could triple by end of 2020s, multiply six-fold by mid-century, and amount to more than ten times the present damage of **€3.4 billion** per year by the end of the century due only to climate change.

- A current damage of €0.8 billion per year with 1500% increase by the end of this century is expected for the transport sector.

- Due to climate change only, investment of €25 billion will be needed by 2040 to make energy infrastructure resilient, stretching to €200 billion by 2100.

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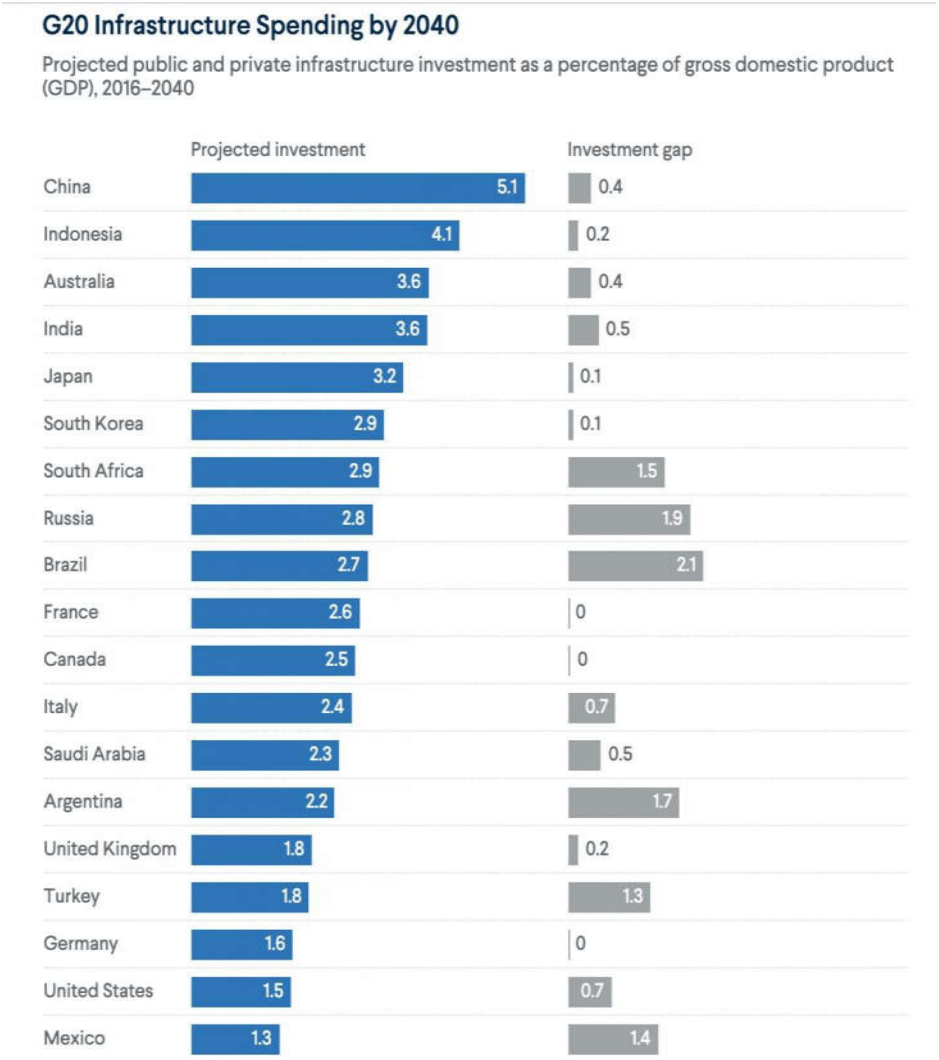

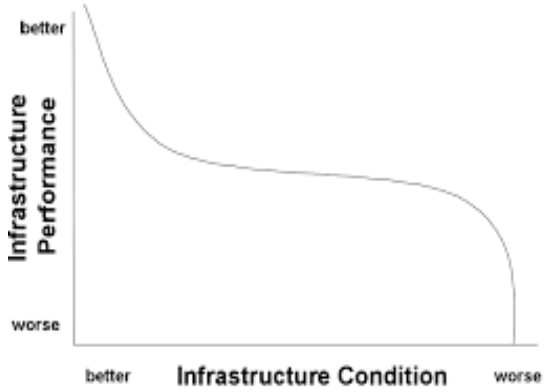

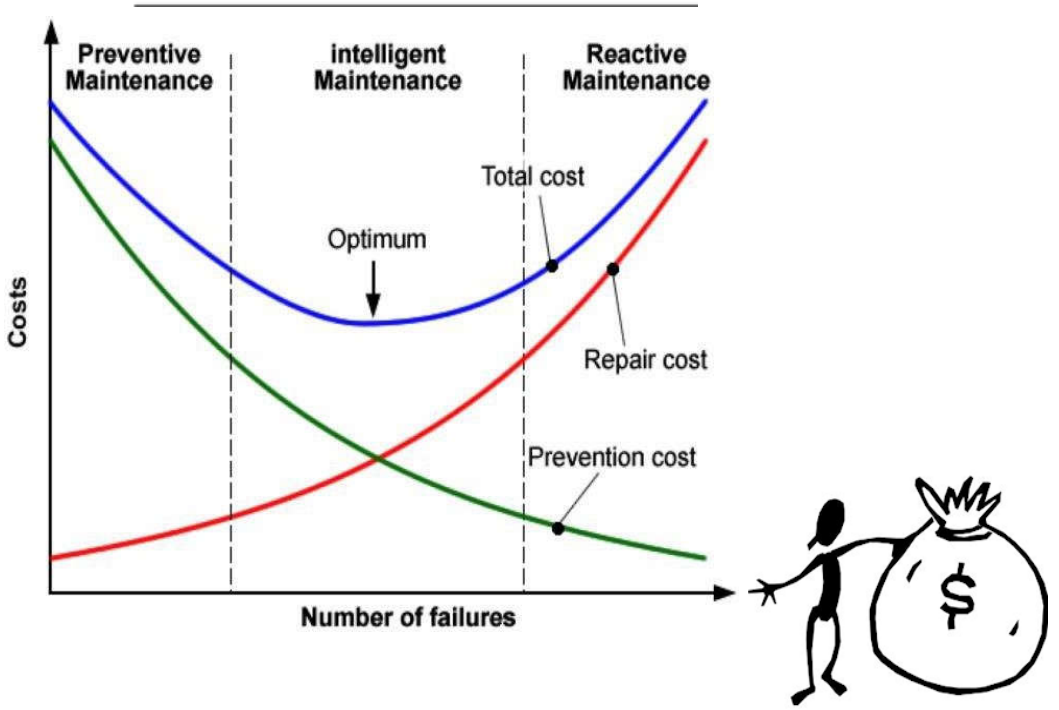

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Key areas
Risk assessment and management
Reliability and resilience
Management and decision-making tools
Monitoring and digitalization
Assessment and intervention

Transversal competences and skills
Critical thinking and capacity of solving problems
Collaborative work in multidisciplinary and multicultural teams
Agility and adaptability to uncertain and highly complex environments
Oral and written communication, to promote structured thinking, persuasion and argumentation skills
Analysis and evaluation of information
Curiosity and imagination
Capacity of developing teamwork virtually

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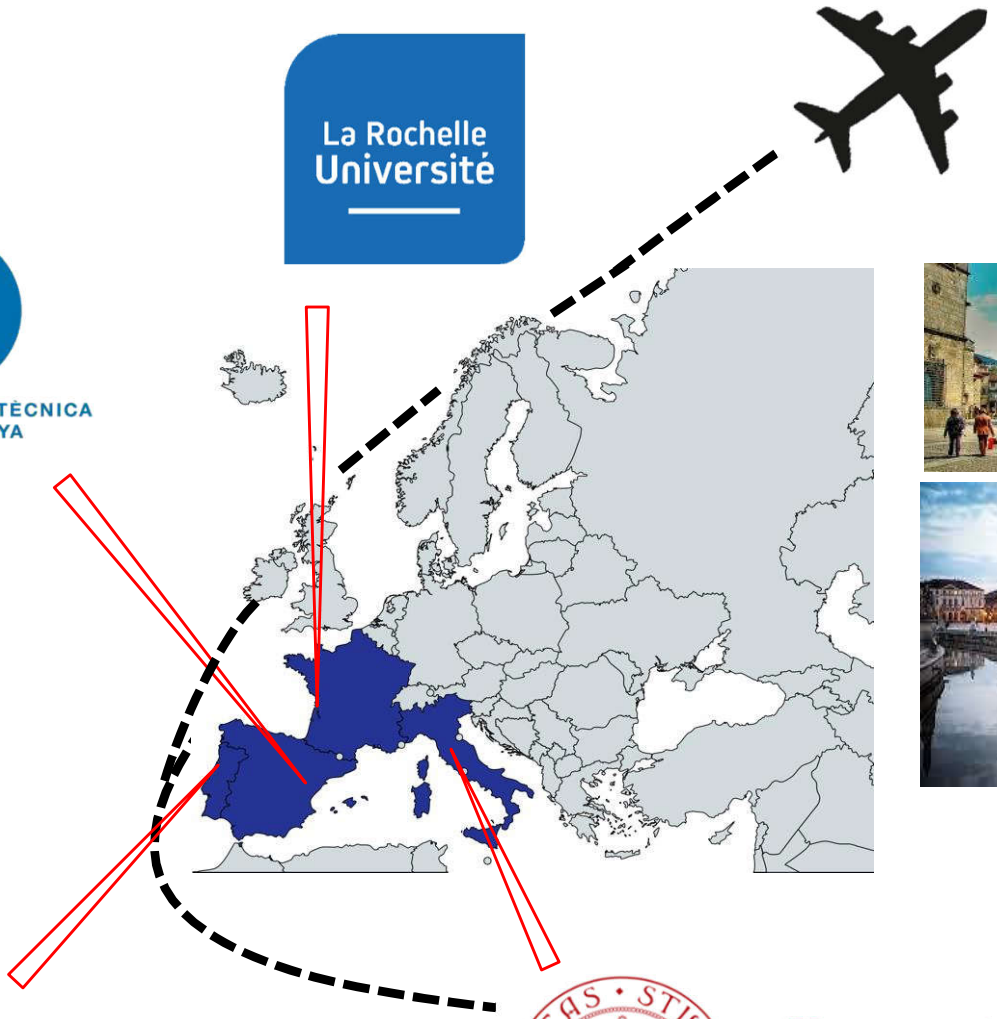
Partnership



Guimarães (PT) – Barcelona (ES) – La Rochelle (FR) – Padova (IT)

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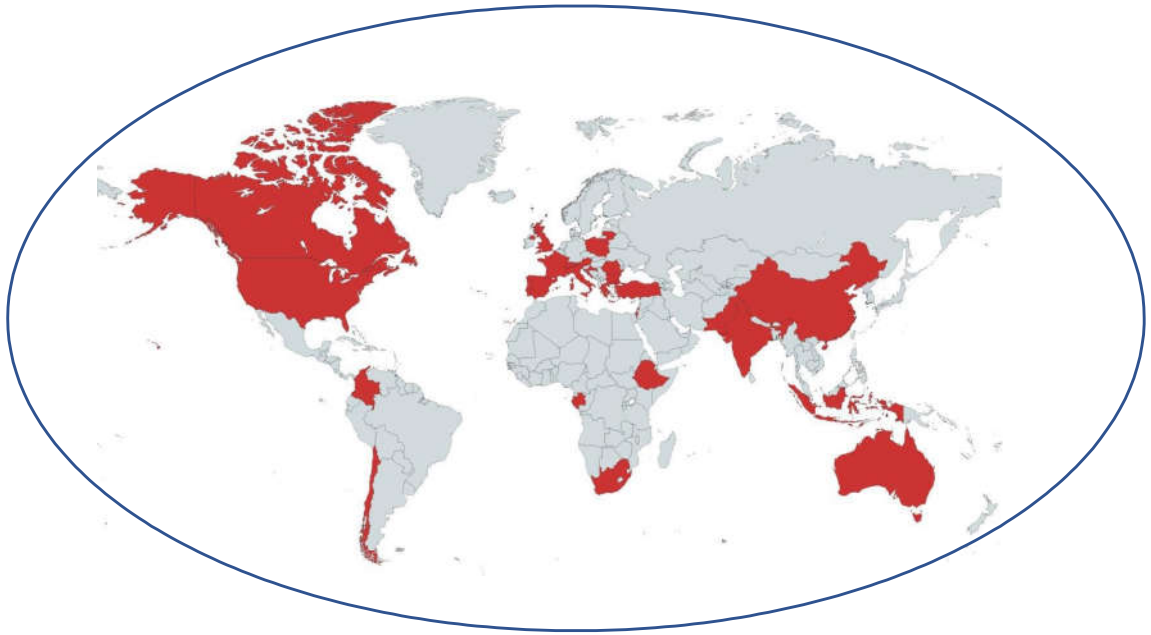
Risk Assessment and management of Civil Infrastructures



Associated Partners

NORISK already counts with **43 Associated Partners**:

- 28 HEIs,
- 8 Industry,
- 4 R&D Institutions;
- 3 NGOs

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- **NR1:** Introduction to risk assessment and management of infrastructures
- **NR2:** Reliability and risk analysis of infrastructures
- **NR3:** Infrastructures management and decision supporting tools
- **NR4:** Monitoring and digitalization of infrastructures
- **NR5:** Assessment and intervention techniques on infrastructures
- **NR6**: Integrated project in risk analysis and management of infrastructures
- **NR7:** Dissertation

			ECTS
Sep. - Mar.	Units 1, 2, 3, 4, 5	6	30
Apr. - Jul.	Dissertation		30

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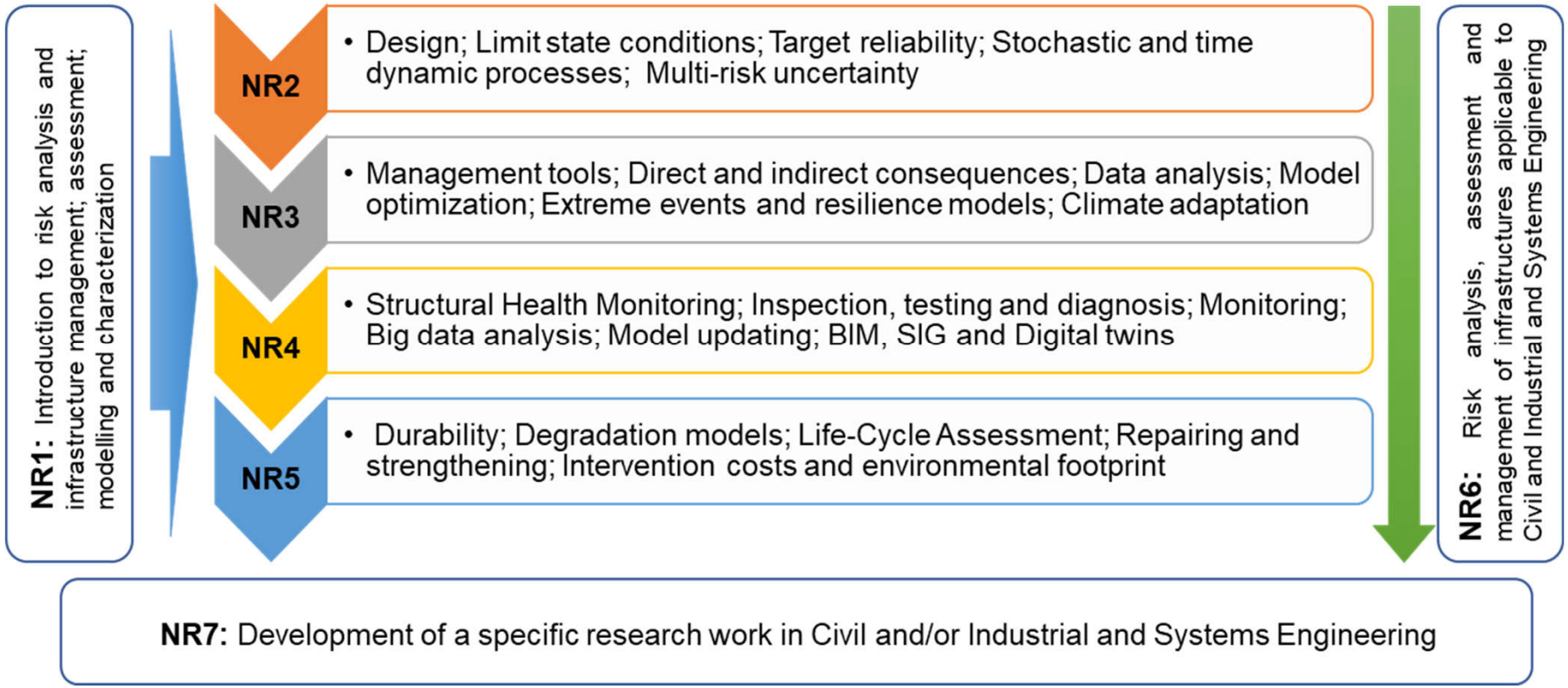
Curricular Units



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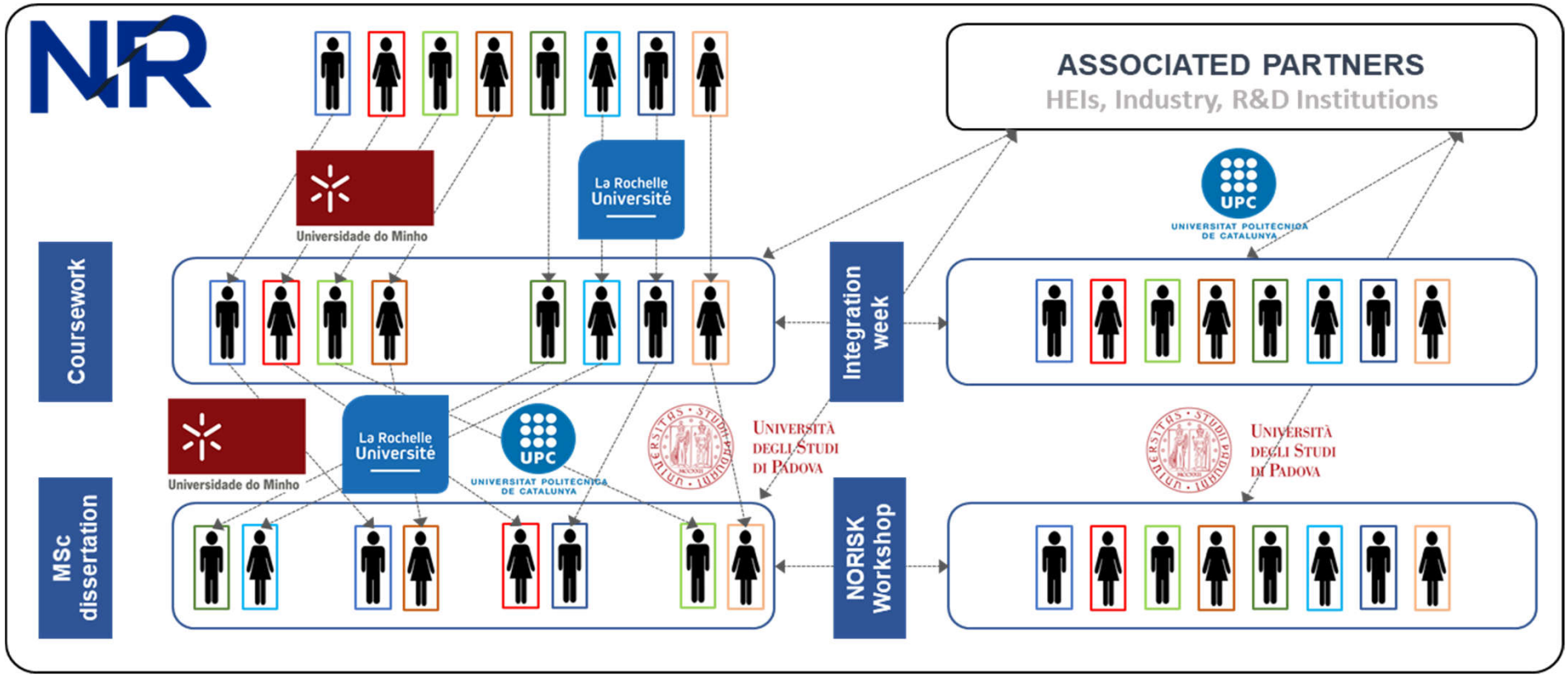
The **NORISK** is organized in two main periods:

i) the coursework (1st semester, 30 ECTS); and the ii) dissertation (2nd semester, 30 ECTS).



Mobility: 1st mobility - coursework (Mandatory); 2nd mobility - Integration Week (Mandatory); 3rd mobility- dissertation (Mandatory); 4th mobility - NORISK Workshop (Optional).

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Each HEI will confer to those NORISK students who will have successfully carried out the complete course and have obtained the minimum requirement of ECTS 30 credits at the Institution itself, an **official Degree Diploma**, fully and automatically recognising the ECTS credits obtained in the other HEI, as well as in any other hosting partner.

	Master Degree in:
UMINHO	Análise do Risco e Gestão de Infraestruturas Civis
UPC	Máster Universitario Erasmus Mundus en Evaluación y gestión de riesgos de infraestructuras civiles - NORISK
LRU	Master Génie Civil – parcours NORISK
UNIPD	Laurea Magistrale in Ingegneria Civile – "NORISK – Risk Assessment and management of civil infrastructures"

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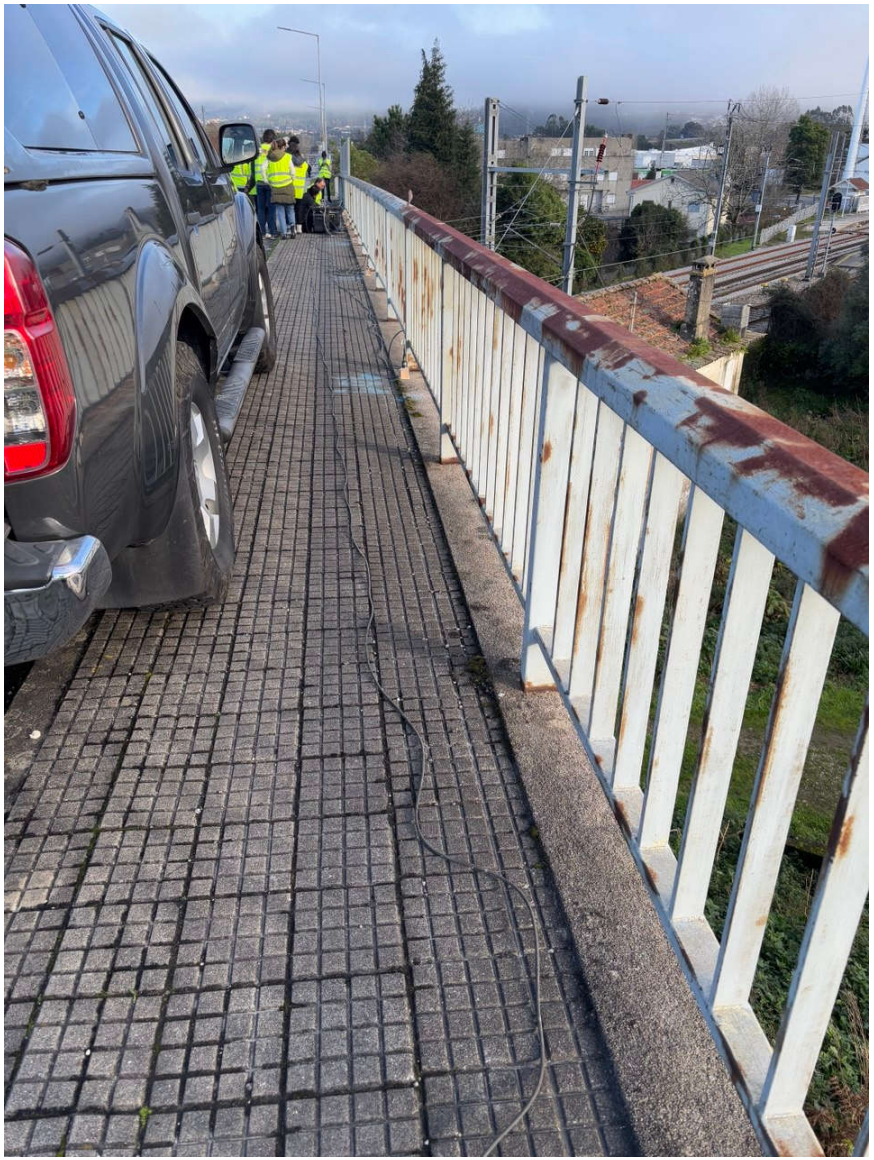

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Thank you for your attention!

Seyedmilad Komarizadehasl

October 2025

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