



## COURSE DESCRIPTION RESILIENCE OF TRANSPORTATION SYSTEMS

## SSD: TRASPORTI (ICAR/05)

DEGREE PROGRAMME: TRANSPORTATION ENGINEERING AND MOBILITY (P55) ACADEMIC YEAR 2022/2023

## **COURSE DESCRIPTION**

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# **GENERAL INFORMATION ABOUT THE COURSE**

INTEGRATED COURSE: NOT APPLICABLE MODULE: NOT APPLICABLE CHANNEL: FG A-Z YEAR OF THE DEGREE PROGRAMME: I PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER II CFU: 6

## **REQUIRED PRELIMINARY COURSES**

None

PREREQUISITES

None

## **LEARNING GOALS**

The course deals with the resilience of transport infrastructures. Starting from local aspects due to service stress, ageing deterioration and rare catastrophic events, the effect on networks and broad areas is estimated/forecasted, including the impact in terms of social and economic terms.

### **EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)**

### Knowledge and understanding

Students gain knowledge about network resilience and understand how the local susceptibility of transport infrastructure propagates through networks. Students apply the acquired knowledge to a case study that explores the effects of failures in transport infrastructure and services.

## Applying knowledge and understanding

The acquired knowledge enables students to further understand, also in the working environment, the methodological and operational principles of resilience-based design in modern transport networks. Students will be able to assess the resilience of transportation networks from the point of view of both public authorities and operators of infrastructures.

#### **COURSE CONTENT/SYLLABUS**

General Principles Theory of transportation systems applied to transportation resilience. •local impact •extended disruption (network impact) Network re-configuration effects •Dynamic processes toward a new equilibrium •Instability Wide-area KPI (Key Performance Indicators) •Area-wide accessibility •Transport times/costs •Social and economic effects Practical approaches •Methods and tools based on traffic assignment matrices. •Identification of the "strategic" network (transportation infrastructures and services to be preserved) Laboratory activities and exercises, project development

#### **READINGS/BIBLIOGRAPHY**

Slides, lecture notes, technical papers.

### **TEACHING METHODS OF THE COURSE (OR MODULE)**

Lectures, laboratory activities, project development and exercises.

### **EXAMINATION/EVALUATION CRITERIA**

#### a) Exam type

- Written
- 🗹 Oral

Project discussion

Other

## In case of a written exam, questions refer to

Multiple choice answers

- Open answers
  - Numerical exercises

b) Evaluation pattern