



## Venice International University VIU Summer School | Critical Infrastructure Resilience

June 26 – 30, 2017

### Schedule:

Morning: 9:30 – 12:30

Afternoon: 14:00 – 18:30

5 days – 10 modules

### **Day 1 – Monday June 26**

**Morning:** Erdem Ergin, University of Tor Vergata (2h)  
Jonas Johansson, Lund University (1h)

#### **Module 1 – Definition and role of critical infrastructure**

The first session will provide background information on critical infrastructure, the connection with globalization and drivers behind the development of the field. It will discuss the structural changes that affect our society as a whole and the drivers of risk. The session will use concrete examples of what governments do to protect their assets in an increasingly interdependent and complex environment.

**Afternoon:** Henrik Hassel, Lund University (4h)

#### **Module 2 – Basics of risk assessment and developing scenarios**

In the second session an overarching framework for risk management, the basics of how to conduct risk assessments, and ways of presenting risk will be given. This will include addressing main components of risk, how to develop and structure scenarios, how to assess likelihoods and consequences and how to present and evaluate risk. The session will give a general introduction to risk assessment with special emphasis on how to apply risk assessment principles & tools on critical infrastructure systems.

### **Day 2 – Tuesday June 27**

**Morning:** Jonas Johansson, Lund University (2h)  
Erdem Ergin, University of Tor Vergata (1h)

#### **Module 3 – Cascading impacts and ranking criticality**

The third session will explore ways to understand the complexities involved with our society's interconnected infrastructures, It will share concrete case studies from recent events such as the European power blackout in 2006, the Eyjafjallajökull Volcanic Eruption in 2010, and the Hurricane Sandy in 2012. Based on these case studies insights into the effect of interdependencies and cascading impacts are given, e.g. key characteristics to consider and geographical scale and temporal aspects of different types of critical infrastructures. It will further be explored on various parameters to scale up and rank the importance of assets and infrastructures based on the methodology used by the UK Government.

**Afternoon:** All present professors (4h)

#### **Module 4 – Applied work: identify critical infrastructure in Venice**

In this session, the participants will form groups to work on an infrastructure of their choice (i.e. energy, transport, waste, tourism, culture, etc.), within the city of Venice. Each group will work with a professor who will provide guidance through a multiple-step process. In this first

step, the group will answer the following questions for the infrastructure: identify the main components, describe the dynamics, identify potential hazard scenarios, look up for past events or similar cases in other cities, are there cities facing similar challenges.



### **Day 3 – Wednesday June 28**

**Morning:** Tomoya Shibayama, Waseda University (3h)

#### **Module 5 – Infrastructure Resilience in coastal zone**

This session will discuss specific resilience applications such as structural design, business continuity planning and preparedness through a series of recent events from the Indian Ocean and the Pacific, such as the 2011 Tohoku Earthquake and its impact on infrastructure lying on coastal zones. This session will discuss and compare European and Asian approaches, and provide a case study of storm counter-measures for Venice and Tokyo.

**Afternoon:** All present professors (4h)

#### **Module 6 – Applied work: risk assessment and prioritization**

In this session, the groups will continue their respective work. This time, the groups will work to: build realistic scenarios that can affect their infrastructure, identify direct and indirect impact, identify interdependencies to other infrastructures, discuss potential cascading impacts, fill out the risk matrix in order to prioritize action needs.

### **Day 4 – Thursday June 29**

**Morning:** Erdem Ergin, University of Tor Vergata (3h)

#### **Module 7 – Overview of resilience management strategies**

This session will discuss the concept of resilience and the differences between engineering and ecological resilience. The session will provide an overview on various risk management strategies, such as risk prevention & reduction, risk transfer and preparedness and share concrete examples from recent and on-going projects. Finally, the session will explain the connections with the risk matrix and the emerging approaches to decision-making under uncertainty.

**Afternoon:** All present professors (4h)

#### **Module 8 – Applied work: develop resilience strategies**

In this final applied session, the groups will pursue their respective work, this time looking into possible solutions for the issues they have identified. They will explore from multiple perspectives, engineering, regulatory, management, social/cultural aspects and try to come up with new solutions. The groups will also outline the links with the other infrastructure.

### **Day 5 – Friday June 30**

**Morning:** Gaetano Vivo, European Commission (3h)

#### **Module 9 – Case study: strategic thinking within the EU**

This session will share the most recent development within the EU, discussing the evolution in the last decade and the current efforts under the current EU Presidency trio (Netherlands, Slovakia and Malta) to make it a priority area of intervention. The session will also discuss the concrete efforts from various governments to build resilience for critical infrastructure and the challenges they face.

**Afternoon:** All present professors (4h)

#### **Module 10 – Recap session/Presentation of results**

In this session the participants will share their applied work to each other with the aim to discuss and contrast their findings, e.g. what are the fundamentals of the infrastructures, what are the differences, which infrastructure seems to be most critical, which infrastructure is at most risk? The aim is further to try and merge the findings to get the system-of-system and a holistic critical infrastructure perspective and addressing questions such as how cascading impacts might lead to unanticipated effects. During the session conceptual and methodological choices and impact on resilience management will also be addressed.