



Venice International University
VIU Summer School
Critical Infrastructure Resilience
July 8 – 12, 2019

Schedule:

Morning: 9:30 – 12:30

Afternoon: 13:30 – 17:30

Venue: Room 9A (1st floor)

Day 1 – Monday July 8

9:15 Welcome coffee and Registration

Morning: Erdem Ergin, Università degli Studi di Roma "Tor Vergata"

Module 1 – Definition and role of critical infrastructure

The first session will provide background information on critical infrastructure and resilience, with a look on the concepts behind them. The session will therefore include a discussion on the structural changes affecting our society as a whole and the drivers of risk. The session will then look at the challenges of building critical infrastructure resilience alongside examples from recent events.

Afternoon: Alexander Cedergren, Lund University

Module 2 – Risk assessment & practical challenges

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 the main components of risk, how to develop and structure scenarios, how to assess likelihoods and consequences and how to present and evaluate risk. The first part of the session elaborates on a general introduction to risk assessment with special emphasis on how to apply risk assessment principles and tools on critical infrastructure systems. The second part of the session provides examples of practical challenges of managing risk to critical infrastructures in multi-actor settings.

Day 2 – Tuesday July 9

Morning: Jonas Johansson, Lund University

Module 3 – Cascading impacts and ranking criticality

The third session will explore ways to understand the complexities involved with our society's interconnected infrastructures and challenges related to addressing critical infrastructure resilience. It will share concrete case studies from events such as the European power blackout in 2006, the Eyjafjallajökull Volcanic Eruption in 2010, and the Hurricane Sandy in 2012 and the assessment of infrastructure resilience through empirical failure data. 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



Venice
International
University

critical infrastructures. It will further explore on various parameters to rank the importance of assets and infrastructures.

Afternoon: Margot Christeller

Module 4 – Post-impact recovery process with multiple stakeholders

This session will focus on how a city-wide post-earthquake recovery programme was done in Christchurch, New Zealand: how the views of the multiple stakeholders were identified and taken account of and how reconstruction decisions on rebuild priorities and phasing were made. It will show the complexity of rebuilding interconnected infrastructure systems while the citizens and the economy continue to depend on it. It will highlight the rebuild programme's strategic successes and its lessons: things for participants to think about when helping redesign the appropriate critical infrastructure systems after disruptive events.

Day 3 – Wednesday July 10

Morning: Margot Christeller

Module 5 – Novel planning and design thinking for climate change

This session will cover the lessons from disaster recovery that are relevant to prepare critical infrastructure services for climate change impacts. Much of the planning and design of critical infrastructure systems is based on the premise of economic development and growth. There is usually an assumption that the underlying physical conditions are stable (when not impacted by a short-term physical disaster). This assumption is being tested by climate change. Examples will be provided at country level and at business level where these learnings have been incorporated into current critical infrastructure planning and investment conversations.

Afternoon: Venice Port Authority

Module 6 – Site Visit to Venice Port Authority Facilities

Day 4 – Thursday July 11

Morning: Carlo Papa, Enel Foundation

Module 7 – Sustainability in operations: the case for resiliency to enter the board room After a brief analysis of the Sendai Framework for disaster risk reduction and a snapshot of increase hazardous phenomena, students will focus their attention on 1-2 business cases related to Investment for resilience and effective response (specific target: power plants, infrastructures and networks)

Afternoon: Available Faculty

Module 8 – Applied Work

This session is an opportunity for participants to share their work, experience and/or thoughts on critical infrastructure resilience. Past editions has shown how the interactive discussions and the cumulative experience of the course gets much richer when we get to learn from each other.

Day 5 – Friday July 12

Morning: Carlo Giupponi, Università Ca' Foscari Venezia

Module 9 – Decision-making under uncertainty

In the ninth session the resilience concept will be applied in the context of how climate change can affect the performance of critical infrastructures and in particular to the case of flood risk in the design of airport infrastructures. A conceptual framework will be proposed and operational solutions will be presented with a case study. Both quantitative and qualitative information are considered for the design of robust plans, i.e. plans that could be resilient to expected climate change impacts. Acquired information are managed in a multi-criteria analysis decision support system, making use of data mining techniques to identify preferable solution within a set of alternative ones.

Afternoon: Available Faculty

Module 10 – Course wrap-up



Venice
International
University