HOW TO PARTICIPATE
In order to apply for this course please click the link below:

https://www.polimi.it/index.php?id=5782&uid=5113&L=1

and insert your application as requested.

The deadline for the application is **23/10/2023**

Minimum number of participants: 10
Maximum number of participants: 30

Admission to the course follows a first-come, first-served basis.

Once the course is confirmed, the applicant receives a communication from the organization with all information about the payment of the registration fee.

RESPONSIBLE ORGANIZATION
Department of Energy – Politecnico di Milano

COURSE DIRECTORS
Prof. Francesco Di Maio – Department of Energy, Politecnico di Milano
Prof. Enrico Zio - Department of Energy, Politecnico di Milano

DURATION, MODE OF DEPLOYMENT AND LOCATION
The course is held from **06.11.2023 to 08.11.2023 from 9.30 to 18.00** (CET).
It will be held in **hybrid setting** (both physical and virtual attendance is allowed) at the Department of Energy - Politecnico di Milano, Campus Bovisa La Masa, 20156, Milano.

REGISTRATION FEE:
€ 2800 (full registration fee)*
€ 1300 (PhD students)*
PHD STUDENTS SHOULD ATTACH TO THE ONLINE REGISTRATION FORM THE OFFICIAL CERTIFICATE OF ENROLLMENT IN THE PHD PROGRAM OF THEIR UNIVERSITY, FOR THE CURRENT YEAR
VAT is not applicable to the registration fees due to art. 10 DPR 633/26.10.72 and subsequent modifications.
*15% discount for participants who registered to the course Fundamentals of Quantitative Risk Assessment held from 16/09/2022 to 07/10/2022

SCHOLARSHIP
The European Safety and Reliability Association (ESRA, www.esrahomepage.eu) supports the course with two scholarships to be awarded to PhD students. Scholarships will be assigned considering the affinity of the candidates' research to the topics of the course, the quality of the candidates' CV and the number and impact of publications in the field.
IF YOU ARE INTERESTED, PLEASE ATTACH YOUR CV TO THE ONLINE REGISTRATION FORM.

COURSE PROGRAM CHAIR
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POLITECNICO MILANO 1863
DIPARTIMENTO DI ENERGIA

ADVANCED QUANTITATIVE RISK & RESILIENCE ASSESSMENT AND MANAGEMENT

II Edition

06.11.2023 – 08.11.2023

Organizers:
Laboratory of Analysis of Signals and Analysis of Risk (LASAR) (www.lasar.polimi.it)
Energy Data and Information Lab (EDILAB)

Sponsorship:
ESRA (European Safety and Reliability Association)

Support:
ARAMIS Srl, Milano, Italy
IEEE – Reliability Society, Italian Chapter
MINES ParisTech, PSL Research University, CRC, Sophia Antipolis, France

COURSE PARTICIPANTS

The course is mainly dedicated to risk analysts and engineers, resilience engineers, technical designers of industrial plants, safety and maintenance managers, asset managers, technicians and operators of surveillance, protection and control of the safety of a facility, researchers and PhD students in the area of Reliability Analysis and Risk Assessment.

TRAINING FORMAT

Lectures will be held in English. All participants will receive a complete set of the presentation slides with specific examples and case studies, selected reference lists and resources in electronic format. The first part of the course is devoted to the presentation of the classical Monte Carlo simulation methods for risk and resilience assessment and management, and advanced concepts on uncertainty (probabilistic, fuzzy, interval) and sensitivity analysis (variance- and distribution-based). In the second part of the course, advanced methods for risk and resilience assessment will be illustrated, including Bayesian Networks and Dynamic Bayesian Networks, Artificial intelligence and Evolutionary algorithms, complex systems and Human factors modelling. Hands-on sessions provide the participants with the opportunity of directly applying the methods to practical case studies (some of these will be held using MATLAB). Finally, in the last part of the course, participants will also be given the opportunity to discuss their experience and technical problems, related to methods and applications.

CERTIFICATE OF ATTENDANCE

At the end of the course, the participants will receive a certificate of attendance, provided that they have attended at least 80% of the course lectures.

MISSION AND GOAL

Systems are increasingly exposed to hazards of disruptive events, such as unexpected system failures, climate change and natural disasters, and malicious terrorism attacks.

In practice, risk assessment is applied to inform risk management on how to protect from the potential losses caused by the disruptive events. The focus is on the accident scenarios, their possible consequences and likelihoods, and the uncertainties therein. The post-accident recovery process is not considered. Yet, given that the sources of hazard leading to disruptive events are extremely uncertain and, thus, difficult to describe and model quantitatively, and that the systems are highly connected to each other so that the impact of the disruption extends beyond the boundary of the individual systems, an extension of the framework of assessment is necessary, calling for an integrated risk and resilience assessment framework that incorporates aspects beyond those of prevention, typical of risk assessment, in order to allow accounting for pre- and post-accident scenarios analysis.

In this sense, the course intends to present the methodologies that allow the integrated assessment of risk and resilience. In particular, the course intends to offer adequate technical-scientific knowledge on advanced risk and resilience assessment methods and provide the most recent methodological tools for their rigorous treatment.

CONTENTS

Monte Carlo simulation and Bayesian Networks (basic, multi-state and dynamic) for risk and resilience assessment and management; Uncertainty and sensitivity analysis, and Human factors in risk and resilience assessment and management; Resilience optimization; Artificial intelligence for risk and resilience assessment and management.

Hands-on:

Monte Carlo simulation, sensitivity analysis, Bayesian Networks.

Round-table:

Presentation and discussion of Case Studies, Researches, Experiences.

LECTURERS

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Department of Energy**,** Politecnico di Milano

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