HOW TO PARTICIPATE
In order to apply for this course please click the link below:
https://www.polimi.it/index.php?id=5782&uid=4692&L=1

and insert your application as requested.

The deadline for the application is **30 May 2021.**

Minimum number of participants: 10
Maximum number of participants: 40

Once the minimum number is reached, you will receive 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 AND MODE OF DEPLOYMENT
The course is held **ONLINE** from 3/06/2021 to 24/06/2021 - each Tuesday and Thursday from 14:00 to 18:00 (Rome time).

REGISTRATION FEE:
€ 2200 (full registration fee)
€ 1000 (PhD students)
VAT is not applicable to the registration fees due to art. 10 DPR 633/26.10.72 and subsequent modifications.
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

SCHOLARSHIP - TBC
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 research to the topics of the course, the quality of the 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 - TBC
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POLITECNICO MILANO 1863
DIPARTIMENTO DI ENERGIA

FUNDAMENTALS OF QUANTITATIVE RISK ASSESSMENT

I Edition

3 – 24 June, 2021

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) – TBC

Support:
ARAMIS Srl, Milano, Italy
Cluster S2D2 (Cluster Security, Safety, Defense, Disaster Management and Recovery) of Politecnico di Milano
CRESCI (Center for Reliability and Safety of Critical Infrastructures), Beihang University, Beijing, China
IEEE – Reliability Society, Italian Chapter
Kyung Hee University, Department of Nuclear Engineering, College of Engineering, Republic of Korea
MINES ParisTech, PSL Research University, CRC, Sophia Antipolis, France

COURSE PARTICIPANTS

The course is mainly dedicated to risk analysts and engineers, resilisence 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 basic concepts of reliability and risk analysis. Essential notions of probability and statistics will be first introduced with focus on failure time distributions, and failure and repair parameters estimation (Maximum Likelihood Estimation (MLE) method, Bayesian method). In the second part of the course, methods for reliability analysis and risk assessment will be illustrated, including Fault Tree, Event Tree, Bow-Tie, Markov modelling, Dependent/common cause failures models and importance measures. 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, real applications of the concepts and methods illustrated in the course are presented. 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

In recent years, concern related with population and environment safety issues has been growing, and their role for social, economic and industrial growth and development has been recognized.

Accordingly, the skills necessary to deal with complex safety issues are now a “must-have” in all sectors where safety analysis is needed to support processes/systems design, since in many sectors a systematic approach to the design and management of systems within established safety limits is unavoidable.

The determination of the risks associated with a given industrial activity and the evaluation of the effectiveness of the protections and barriers in place require a multidisciplinary approach that allows to:

- identify the sources of potential danger;
- determine the evolution of the accident scenarios;
- evaluate the frequency of occurrence of accident scenarios starting from the reliability data of the components and protection systems involved;
- evaluate the consequences of the accident scenarios.

Therefore, the identification, understanding and management of industrial risks, and their interaction with environmental systems, require the knowledge of appropriate analysis methodologies.

In this sense, the course intends to consider the safety problems deriving from modern industrial activities and to present the methodologies that allow the assessment and control of associated risks. In particular, the course intends to offer adequate technical-scientific knowledge on critical safety issues, risk analysis, reliability engineering and provide the basic methodological tools for their rigorous treatment.

CONTENTS

Basics of Reliability Analysis and Risk Assessment:

Failure time distributions, failure and repair parameters estimation

Methods for Reliability Analysis and Risk Assessment:

Reliability and availability of simple systems; Fault Tree; Event Tree; Bow-Tie; Markov modelling; Dependent and common cause failures; Importance measures.

Hands-on:

Failure time distributions; failure and repair parameters estimation; Reliability and availability of simple systems; Fault Tree; Event Tree; Bow-Tie; Markov modelling.

Round-table:

Presentation and discussion of Case Studies, Researches, Experiences.

LECTURERS (to be confirmed)

Piero Baraldi (PhD)
Associate Professor
Department of Energy, Politecnico di Milano

Michele Compare (PhD)
CEO
ARAMIS Srl, Milano

Francesco Di Maio (PhD)
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