SSM
Scuola Superiore Meridionale

Course title:

Risk Analysis in Industrial Chemical Processes

Duration [number of hours]: 12

PhD Program [MERC/MPS/SPACE]: MERC

Name and Contact Details of Lecturer(s):

Almerinda Di Benedetto, Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale
Ernesto Salzano, Dipartimento di Ingegneria Civile, Chimica, Ambientale e dei Materiali - Università di Bologna

Course Description [max 150 words]:

The course aims to introduce the basic notions of Risks Analysis in Chemical processes also providing the tools for conducting a complete risk assessment of industrial chemical processes.
Topics covered include the fundamentals of combustion safety including explosions, fires and toxic dispersion, the notion of accidental scenario, the models for quantifying losses and dispersions, risk maps. Examples and case histories will be discussed and projects for the risk assessment of case study will be assigned.

Syllabus [itemized list of course topics]:

- Combustion Safety: flammability of gas/liquid and dusts. Fires and explosions. Toxicity and industrial hygiene. Thermodynamic of explosion phenomena.
- Models for describing accidental industrial scenario: loss and dispersions.
- Models for evaluating the consequences of explosions/fires and toxic release. Use of software.
- Calculation of risk indexes adopted in the process industry. Acceptability criteria, and their use for plant design, layout options, land-use planning, licensing requirement and regulations.

Assessment [form of assessment, e.g. final written/oral exam, solutions of problems during the course, final project to be handed-in etc]:

Intermediate Projects assigned during the course

Suggested reading and online resources:

- D.A.Crowl and J.F.Louvar, Chemical Process safety: Fundamentals with Applications, 2nd Edition, Prentice Hall PTR.
- Guidelines for Chemical Process Quantitative Risk Analysis, 2nd Edition, CCPS (Center for Chemical Process Safety), ISBN: 978-0-816-90720-5 October 1999
- J. S. Arendt, D K. Lorenzo, Evaluating Process Safety in the Chemical Industry: A User's Guide to Quantitative Risk Analysis, CCPS (Center for Chemical Process Safety), ISBN: 978-0-816-90746-5 June 2000
- https://www.epa.gov/cameo/aloha-software