

Programme of “SICUREZZA NELLA PROGETTAZIONE DEGLI IMPIANTI DI PROCESSO” SAFETY IN PROCESS PLANT DESIGN		
<ul style="list-style-type: none"> • Code: I0740 • type of course unit: COMPULSORY • level of course unit: second cycle, Chemical Engineering • year of study: 1nd; semester: 1st 		
Number of ECTS credits: 9 (workload is 225 hours; 1 credit = 25 hours)		
Teacher : Valentina Innocenzi (valentina.innocenzi1@univaq.it)		
1	Course objectives	<p>The course is focused on the important technical fundamentals of chemical process safety, risk analysis, including hazards identification, risk assessment; general criteria about the design to prevent fires, explosions and relief systems are described giving some practical engineering examples. Moreover general considerations about the design and economical principles are described. In this way the students should be able:</p> <p>The student must acquire the ability:</p> <ul style="list-style-type: none"> • to select and design in safety the unit equipments and auxiliaries • to analyze any chemical process problem with an integrated approach to the technical, social and economic aspects
2	Course content and Learning outcomes (Dublin descriptors)	<p>Expected results:</p> <ul style="list-style-type: none"> • Acquiring knowledge and understanding on the design-project procedures • Applying knowledge and understanding for designing process equipments and auxiliaries • Communicating knowledge and understanding in safety and environmental impact • Acquiring capacities to continue learning mainly on the field of risks in chemical processes <p>Topics of the module include:</p> <p>Risk analysis: process hazard identification (checklists, safety review, relative ranking, hazop, what-if, fmea), risk assessment (event trees, fault trees, probability theory, human reliability), consequences analysis (source models, dispersion models, fires and explosions), risk evaluation, risk perception. Risk prevention (design of inerting system, ventilation, relief systems, chimneys and flares, storage tanks). Safety legislation. Economic and engineering principles (cost of equipments, estimation of capital investment, optimum design and applications).</p> <p>On successful completion of this module, the student should:</p> <ul style="list-style-type: none"> - have profound knowledge of risk analysis - have knowledge and understanding of the complexity of a chemical plant - demonstrate skill in perform qualitative flow diagram and ability to design the main units and evaluate the investment - demonstrate capacity for reading and understanding other interdisciplinary texts on related topics, international standards, laws and regulations for chemical process at risk.
3	Prerequisites and learning activities	To benefit from the course, students must know basic transport phenomena and unit operation fundamentals.
4	Teaching methods and language	<p>Lectures, exercises</p> <p>Language: Italian/English (when required by students)</p> <p>Ref. Text books:</p> <ul style="list-style-type: none"> - Presentations prepared by the Teacher; - D.A. Crowl, J.F. Louvar, Chemical Process Safety: Fundamentals with Applications, Prentice Hall, 1990 - M.E. Peters and K.D. Timmerhaus, Plant Design and Economics for Chemical Engineering, McGraw-Hill Int. Ed., New York, 1991
5	Assessment methods and criteria	Oral examination