

COURSE ID SHEET



Course No. 5149 NTUA

Semester: 9 Core X Elective Specialization

Title: **SAFETY OF INDUSTRIAL INSTALLATIONS**

Aim: Description, modeling and simulation of basic phenomena that take place during various phases of accidents in industrial installations that produce and/or store toxic/flammable substances.

Content:

- Major Hazard Industrial Accidents (MHIA) involving dangerous chemical substances (gases and liquids):** Definitions, National and European legislative framework, Emergency planning, Risk assessment of MHIA, Domino effect, Protection Zones and Safety reports, Types of tanks and sensors of toxic substances, Examples of MHIA.
- Introduction to outflow (leakage) of gases and liquids:** Types of outflows, Calculation methods, Turbulent free jet.
- Introduction to Dispersion of toxic and/or flammable substances.**
- Evaporation of Liquids and Pressurized (liquefied) Gases.**
- Fire and Explosion models** (Pool fire, Jet fire, Flash fire, Fireball, BLEVE, Vapor Cloud Explosion).
- Computer Laboratory (optional):** Practice of students with computer aided tools in order to prevent, assess and manage the impact of MHIA (evaporation of toxic substances, dispersion of liquids, fire and explosion models involving tank storage gases, liquids and liquefied gases, protection zones simulation, etc.)

Hours per semester:

LECTURES	16	EXERCISES	-	LABORATORY	8	HOME-WORK	76	TOTAL HOURS: 100
----------	----	-----------	---	------------	---	-----------	----	-------------------------

Student performance/evaluation:

The Final Grade results as follows:

- Final Grade = $0.7 \times (FE) + 0.3 \times (LE)$**
(for those participating in the LE and where LE grade > FE grade)
- Final Grade = (FE)**
(for those not participating in the LE or if LE grade < FE grade)

Where:

- FE = Final (written) Examination, and
- LE = optional Laboratory (written) written Examination or Topic Report (valid only for those students who attend the laboratory and with only a positive contribution).