COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
DEPARTMENT	DEPARTMENT OF CHEMISTRY		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	EN26	**SEMESTER**	7th /8th Semester
COURSE TITLE	Health and Safety at Work		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
theory	3	3
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	Specialization & Skills Development
PREREQUISITES:	
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass2.emt.duth.gr/courses/CHEM_E101/

(2) LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The primary objective of this course is to demonstrate that all operations within the Chemical Industry entail inherent risks to health and human life. Risks are categorized into occupational and non-occupational. This classification is directly linked to the choice of professional sector and signifies, to a large extent, the implicit acceptance of exposure to the specific hazards associated with each role.

Given that the absolute elimination of risk is unattainable, the focus is shifted toward its drastic mitigation, considering the various social, economic, and political factors that influence risk reduction strategies. The concept of risk is dual-natured, perceived either as an objective reality or as a construct of cognitive processes. The development of risk perception and the perceived probability of exposure are significantly influenced by a worker's experience and formal training. Furthermore, consistent risk communication and the broad dissemination of information are pivotal in raising awareness and fostering a robust safety culture.

Upon successful completion of the course, students will have acquired the fundamental knowledge and competencies regarding Occupational Health and Safety.

The participant will be able to:

- Comprehend the significance of occupational safety, the factors contributing to the impairment of workers' health and physical integrity, the necessity of risk analysis/assessment, the categorization and evaluation of risk mitigation/elimination measures, and the roles of all stakeholders involved.

- Understand the role of the state and other health organizations regarding hygiene, health, and safety in the workplace.
- Analyze the legislative framework for Occupational Health and Safety (OHS), including the general provisions and objectives of each legislative act.
- Identify the regulations of the current legal framework concerning the Health and Safety of employees.
- Understand the provisions of Civil, Criminal, and Labor Law regarding the protection of workers' Health and Safety.
- Evaluate the contribution of human error to the occurrence of industrial accidents and analyze human behavior in the face of risk.
- Define the concept of risk, the methods of risk management, and the tools utilized for the identification of occupational hazards.
- Identify the minimum requirements and specifications that workplaces must meet to accommodate work stations.
- Acquire fundamental knowledge regarding the design of new workstations, as well as the evaluation and redesign of existing ones.
- Gain fundamental knowledge concerning the adverse effects of high noise levels on employees and overall work productivity.
- Acquire basic knowledge regarding hazards from dangerous chemical substances, risk assessment methodologies, and protective measures.
- Gain fundamental knowledge for the selection, evaluation, and rules for the utilization of Personal Protective Equipment (PPE).
- Select the appropriate PPE for each fire category and for activities with inherent specificities.
- Recognize the vital importance of Occupational Risk Assessment.
- Distinguish between different types of safety hazards.
- Acquire fundamental knowledge regarding the categories of liquid and gaseous fuels, conventional extinguishing agents, fire-fighting equipment, and fire suppression techniques using appropriate extinguishing media.
- Select the suitable extinguishing agent for each fire classification.
- Recognize the significance of the phenomena occurring in each fire category.
- Distinguish between different firefighting approaches and evaluate their respective advantages and disadvantages.

Students will acquire knowledge regarding:

- Sources of hazards and risk factors.
- Procedures for drafting a formal Risk Assessment.
- Qualitative assessment methods for hazard identification.
- Risk evaluation and quantitative risk assessment (QRA) methodologies.

Skills & Competencies:

- Comprehend the fundamental principles of occupational health and safety (OHS).
- Integrate OHS knowledge into their professional activities and workflows.
- Develop the ability to apply current legislation regarding rights and obligations in the workplace, both from an employee's and an employer's perspective.
- Implement fundamental safety rules and appropriate measures to minimize industrial accidents.
- Internalize the necessity of implementing both preventive and corrective/suppressive measures to safeguard infrastructure and human life, ensuring emergency preparedness.
- Acknowledge that the effective protection of Health and Safety within the Chemical Industry is a shared responsibility achieved through the proper utilization of available resources.
- Encourage and support colleagues who demonstrate aptitude in safety training and education.
- Understand the limitations and inherent uncertainties associated with the risk assessment process.

Competencies:

- Cultivate a safety and health mindset that positively influences both employee activities and overall organizational operations.
- Adopt self-monitoring and self-inspection procedures regarding health and safety conditions within the workplace.
- Utilize the appropriate Personal Protective Equipment (PPE) for each specific activity characterized by inherent hazards or technical specificities.
- Implement correct operational procedures and protocols in the management of all firefighting operations.
- Integrate acquired knowledge and safety best practices into their daily professional activities and workflows.
- Develop a comprehensive risk assessment methodology.
- Elaborate and execute the general steps and stages involved in the risk assessment process.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

The student will be able to:

- Utilize the theoretical foundations of Occupational Health and Safety to meet the professional requirements and duties of a Safety Officer (Safety Technician).
- Access diverse information sources, cross-reference data, and synthesize key findings.

Specifically, the course content fosters the following competencies:

- Search, analysis, and synthesis of data and information, utilizing the necessary technologies.
- Promotion of free, creative, and inductive thinking.
- Working in an international environment.
- Working in an interdisciplinary environment.
- Autonomous work.
- Teamwork.
- Project planning and management.
- Respect for diversity and multiculturalism.
- Demonstration of social, professional, and ethical responsibility, including sensitivity to gender issues.
- Decision-making.
- Adaptation to new situations.
- Respect for the natural environment.

(3) COURSE CONTENT

- Introduction, historical background, and scope of Occupational Health and Safety (OHS).
- National and European Union (EU) institutional and legislative framework for OHS.
- Hazardous chemical substances.
- Fire protection and fire safety issues.
- Risk management, occupational risk assessment, and common industrial hazards.
- Technological accidents and Occupational Health and Safety.
- Major Technological Accidents (MTA), emergency planning, risk assessment methodologies for MTAs, and domino effects.
- Safety reports and safety studies.

- Description, mathematical modeling, and simulation of the primary phenomena occurring during the various stages of accidents in industrial facilities that produce, store, and/or transport hazardous materials.

(4) LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face-to-face tutorials
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	• Organization of course material into PowerPoint slides. • Learning process support via the e-learning platform https://eclass.emt.duth.gr/ • Communication through email.
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	**Activity** / **Workload/semester** Lectures: 39 Literature research and critical analysis: 36 Total Course Hours 25 hours per credit: 75 Total workload
STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	**Student evaluation methods** Final written exam consisting

(5) SUGGESTED BIBLIOGRAPHY

- *Hughes Phil, Υγεία και Ασφάλεια στο Χώρο Εργασίας Broken Hill Publishers Ltd 2021 ISBN: 9789925588299*
  Κωδικός Βιβλίου στον Εύδοξο : 102070198
- *AIChe/CCPS, Guidelines for Chemical Process Quantitative Risk Analysis, AIChE, 1989.*
- *AIHA, Emergency Response Planning Guidelines, AIHA, 1995.*
- *Ανάλυση επικινδυνότητας. Εγχειρίδιο υπολογισμών των επιπτώσεων φωτιάς, έκρηξης και διασποράς τοξικών ρύπων (ISBN: 978-960-418-148-3)*

- *Safety Science*
- *Safety*
- *IETI Transactions on Ergonomics and Safety*
- *SCIREA Journal of Safety Science and Technology*