STUDY GUIDE

Occupational Health and Safety at Chemical Laboratories

Organised by

Universidad de Cantabria, Poznan University of Technology, University of Vaasa

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1. IDENTIFYING DATA

Course Name.	Occupational Health and Safety at Chemical Laboratories.
Coordinating University.	Universidad de Cantabria (UC)
Partner Universities Involved.	• Vaasan Yliopisto (UVaasa) • Politechnika Poznańska (PUT)
Course Field(s).	Occupational Health and Safety.
Related Study Programme.	Transdisciplinary course, open to workers, granters and students from any study programme.
ISCED Code.	1022: Occupational health and safety.
Sustainable Development Goals	The course pays particular attention to: ○ SDG 3 Good Health and Well-being. ○ SDG 4 Quality Education. ○ SDG 5 Gender Equality. ○ SDG 8 Decent work and Economic Growth, SDG 9 Industry, Innovation and Infrastructure. ○ SDG 11 Sustainable Cities and Communities. ○ SDG 12 Responsible Consumption and Production. ○ SDG 16 Peace, Justice and Strong institutions. ○ SDG 17 Partnerships for the Goals.
Study Level.	Open to all study levels and university staff.

EUNICE Key Competencies.	
Problem solving	Green - strongly
Self-management	Green - strongly
Cognitive flexibility	Orange - moderately
Digital competence	Orange - moderately
Technical competence	Orange - moderately
Global intercultural competence	Green - strongly

Number of ECTS credits allocated.	0.5 ECTS
Mode of Delivery.	Online self-study
Language of Instruction.	English
Course Dates.	Semestral
Schedule of the course.	N/A
Key Words.	Occupational Health and Safety, Health and Safety, Chemicals, Chemical Laboratories, Chemical risks, Emergency rules.
Motivational Phrase.	Safety first - no experiment is more important than your well-being

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Prerequisites and co-requisites.	B2 in English.
Number of EUNICE students that can attend the Course.	100.
Course inscription procedure(s).	Course inscription through the **EUNICE Platform available here**. The course is free of charge.

2. CONTACT DETAILS

Department.	• Health and Safety Unit, Infrastructure Service, Management, University of Cantabria (UC). • School of Technology and Innovations, Energy Technology, University of Vaasa (UVA). • Faculty of Civil and Transport Engineering / Faculty of Environmental Engineering and Energy, Poznan University of Technology (PUT).
Name of Lecturer.	**Module I. Information and basic safety rules** • MSc. Ciro Salcines (UC) **Module II. Chemical contaminants** • PhD. Katriina Sirviö (UVA) • MSc. Sonja Heikkilä (UVA) **Module III. Emergency** • Professor Adam Glema (PUT) • Professor Krzysztof Dziarski (PUT)
E-mail.	• ciroluis.salcines@unican.es • katriina.sirvio@uwasa.fi • adam.glema@put.poznan.pl • sonja.heikkila@uwasa.fi • krzysztof.dziarski@put.poznan.pl • eunice@unican.es
Other Lecturers.	N/A.

3. COURSE CONTENT

Goals:

- Knowing and understanding occupational health and safety European framework Directives, Regulations and standards.
- Knowing the main occupational laboratory risks and precautionary measures for improving safety work conditions.

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4. LEARNING OUTCOMES

Knowledge-Based Outcomes

- Understanding key principles of occupational health and safety, particularly as they relate to laboratory environments.
- Identifying common hazards in laboratories (chemical, physical and ergonomic).
- Recognizing relevant European legislation, regulations, and standards governing lab safety.
- Understanding the roles and responsibilities of employers, employees, and safety officers in maintaining a safe workplace.

Skills-Based Outcomes

- Conduct risk assessments to identify and evaluate potential hazards in the lab.
- Apply control measures such as engineering controls, administrative practices, and PPE (Personal Protective Equipment).
- Respond effectively to emergencies, including chemical spills, fire, or exposure incidents.
- Properly store, handle and dispose of hazardous materials.
- Accurately interpret and use Safety Data Sheets (SDS) and chemical labeling systems.

Attitudinal/Behavioral Outcomes

- Promoting a culture of safety and demonstrate ethical responsibility in laboratory practices.
- Encouraging reporting of unsafe conditions and near-misses without fear of retaliation.
- Maintain a proactive approach to continuous improvement in health and safety practices.

5. OBJECTIVES

The EUNICE Course “Occupational Health and Safety at Chemical Laboratories” aims at providing an audience of workers and students with the opportunity to develop their knowledge on health and safety from an interdisciplinary perspective.

Introduce fundamental concepts of occupational health and safety with specific emphasis on laboratory settings. Raise awareness of potential hazards in laboratories, including chemical, physical, and ergonomic risks. Encourage a proactive safety culture and ethical responsibility within laboratory environments.

6. COURSE ORGANISATION

UNITS

1	**Module I. Information and basic safety rules.** Topic A: European directives on safety and health at work. Topic B: Occupational health and safety rules. Topic C: General guideline for laboratory work. Work organization. Topic D: Handling chemicals, glassware and equipment. Topic E: Contaminants classification. Topic F: Hierarchy of control.

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	Topic G: Chemical exposure routes. Topic H: Personal protective equipment. Topic I: Material safety data sheet.
2	**Module II. Chemical contaminants.** Topic A: Contaminant's classification Topic B: Hierarchy of controls Topic C: Control measures Topic D: Exposure to a substance is uptake into the body Topic E: Fume hoods Topic F: Biosafety cabinets Topic G: Personal protective equipment Topic H: Safety data sheet and chemical label Topic I: Chemical waste
3	**Module III. Emergency.** Topic A: Emergency number and equipment Topic B: How to act in case of fire or emergency Topic C: What is a fire? The fire triangle. Topic D: Types of fire. Topic E: Stages of fire Topic F: Types of fire extinguisher. Topic G: OHS Contact at University of Cantabria (UC), University of Vaasa (UVA) and Poznan University of Technology (PUT)

LEARNING RESOURCES AND TOOLS

The learning resources and assessment tools of the course are available at the EUNICE Moodle Platform.

COURSE INSTRUCTIONS

1. The course is divided into **three modules**, which must be completed **in order**. Once you finish reviewing a module, the next one will automatically become accessible.
2. After you have reviewed **all course content and materials**, the **online assessment** will be unlocked and available for you to complete.
3. The course will remain open, so you can **revisit the materials** and **take the assessment** at any time.

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS

Students will have access to written course contents, and an automatic online exam in EUNICE Moodle online environment. Students can review the materials and do the assessments at their

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own pace during the course delivery period. The course is asynchronous and can be reviewed at any time. Students' activity in EUNICE Moodle is expected to consist of the following:

- Reading and familiarization with the text materials available on the course site.
- Taking the exam that measures students' knowledge and skills in content.

The course is completed by independently working and by taking the exam which consists of multiple-choice questions covering the course topics. The course is graded "passed" or "failed".

As an additional optional activity, each sub-topic will have a forum for students to share their questions, discussions or doubts. It will be moderated by the professors and lecturers, with input from professors when necessary. All students are free to participate and post their queries.

7. ASSESSMENT METHODS, CRITERIA AND PERIOD

COURSE COMPLETION (CERTIFICATE)

To complete the course, you must:

1. **Review 100% of the course materials.**
2. **Successfully pass the Automatic Online Assessment** by correctly answering **at least 6 out of the 10 questions**.
   Please note: You have only **two attempts to complete the assessment, and each attempt has a **time limit of 25 minutes**.*
3. **Complete both the pre-course and post-course surveys.**
   These surveys take approximately **3-5 minutes each. Your responses are essential for issuing your **free certificate** and for reporting and justification purposes.*

Upon fulfillment of the course completion criteria, you will be able to download the Course Certificate directly from the course platform.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

Article 153 of the Treaty on the Functioning of the European Union gives the EU the authority to adopt directives in the field of safety and health at work.

The European Framework Directive on Safety and Health at Work (**Directive 89/391 EEC**) adopted in 1989 was a substantial milestone in improving safety and health at work. It guarantees minimum safety and health requirements throughout Europe while Member States are allowed to maintain or establish more stringent measures.

Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace.

Directive 92/58/EEC lays down the requirements for safety and health signs at work.

Directive 2009/104/EC of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work.

Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.

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Regulation 2016/425/EU of 9 March 2016 on PPE contains provisions on the design, manufacture and placing on the market of PPE. The EU regulation applies to all PPE placed on the market (not just PPE used in the workplace) and sets out the rules for manufacturers.
Regulation (EU) 2023/1230 of the European Parliament and of the Council of 14 June 2023 on machinery replaces Directive 2006/42/EC on machinery.
Regulation (EU) 2023/988 of the European Parliament and of the Council of 10 May 2023 on general product safety replaces Directive 2001/95/EC and aims to ensure the health and safety of consumers and the functioning of the internal market.
EN 14175-1:2004. Fume cupboards. Part 1: Vocabulary.
EN 14175-2:2003. Fume cupboards. Safety and performance requirements.
EN 14175-6:2003. Fume cupboards. Variable air volume methods fume cupboards.
EN 14175-7:2003. Fume cupboards. Fume cupboards for high heat and acidic load.
EN 12469. Biotechnology. Performance criteria for microbiological safety cabinets.
EN 12469-1. Biological safety cabinets - Part 1: Classes and basic requirements**.**
EN 12469-2. Biological safety cabinets - Part 2: BSC class II.
EN 12469-5. Biological safety cabinets - Part 5: Installation, commissioning and routine testing.

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