Module Specification:

M06. Safe Workplaces

Within the Erasmus+ KA2 Capacity Building Project (CBHE)

WORK4CE – Cross-domain competences for healthy and safe work in the 21st century

619034-EPP-1-2020-1-UA-EPPKA2-CBHE-JP

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Version 0.1, 31.03.2021
Version 0.2, 07.11.2021
Version 0.3, 19.02.2022

Co-funded by the
Erasmus+ Programme
of the European Union

1 Summary

Remark: The Module Specification serves as the foundation for the development of eLearning modules by the Open Communities of Practice (OpenCoP). The modules incorporate a selection of educational resources and didactic formats. This summary provides a brief (1-2 pages) overview of the Module Specification.

Overview:
Digitalisation introduces both opportunities and challenges to occupational safety and health (OSH). With the integration of AI, robotics, the Internet of Things (IoT), and big data, work environments are evolving. This module explores strategies to mitigate digital risks while fostering a safe and productive workplace. The module will provide insights into the regulatory landscape, innovative safety technologies, and methodologies for ensuring safety in Industry 4.0.

Overall Learning Outcome:
Upon completion of this module, students will:

- Understand traditional OSH rules & standards.
- Analyze the human factor in occupational health and safety.
- Assess digital and sociotechnical transformations of work.
- Evaluate ethical issues of digitalization in workplaces.
- Examine productivity and well-being in digitalized work environments.
- Implement strategies for managing organizations in digital transformation.
- Develop sustainable organizational practices for a safe workplace.
- Enhance competencies in digital work and cognitive ergonomics.

2. Target Group Analysis

The module is designed for:

- **Students**: MSc students in Computer Science, IT, Project Management, Business Administration, Software Development, Digital Transformation, Engineering, and Occupational Health & Safety.
- **Professionals**: OSH specialists, industrial employers, and policymakers.
- **Educational Providers**: Universities and professional training institutes.
- **Small and Medium Enterprises (SMEs)** and stakeholders involved in workplace safety policy-making.

Knowledge	Skills	Competence
In-depth understanding of occupational safety regulations and risk management frameworks.	Apply risk management methodologies for workplace safety.	Lead safety initiatives within organizations.
Theoretical and practical knowledge of OSH management systems and digital safety tools.	Develop OSH policies that align with digital transformation.	Develop and implement safety training programs.
Understanding of workplace safety implications due to Industry 4.0 and automation.	Utilize digital tools for safety assessments and compliance tracking.	Manage compliance with regulatory standards.

Selection of Content

The module covers the following topics:

- Introduction to Occupational Health and Safety (OSH)
- Risk management and hazard protection
- OSH management systems, audits, laws, and ISO standards
- OSH challenges in digital transformation (automation, AI, robotics, cybersecurity)
- Digital tools for OSH, including virtual reality (VR) training and wearable technologies
- Psychological and ergonomic considerations in modern workplaces
- Future trends in OSH and Industry 4.0

Activities and Teaching/Learning Methods

The module employs a blended learning approach, including:

- Online courses, eBooks, and research papers (flipped classroom approach)
- Interactive case studies and real-world industry scenarios
- Hands-on workshops using digital safety tools
- Group projects and presentations
- Virtual Reality (VR) simulations and assessments
- Guest lectures from industry experts

Teaching Materials & Technical Requirements

Required Materials:

- Learning Management System (Moodle)
- Communication software (Microsoft Teams, Zoom)
- High-speed internet connection
- VR equipment for simulations
- Project management tools (JIRA, Trello)
- Online knowledge databases and OSH legislation resources

Tailoring & Educational Tracks

- Practical Track: Hands-on experience with workplace safety tools and case studies.
- Entrepreneurial Track: Developing safety-driven business strategies.
- Scientific Track: Conducting research on digital transformation's impact on OSH.

Competence Assessment

Assessment Type	Weight (%)	Description
Written Exam (Online Test)	30%	Testing theoretical knowledge
Group Project: Safe Workplace Concept	25%	Case study analysis and project execution
Team Presentation 1 (Project Kick-off)	10%	Initial concept presentation
Individual/Group Case Study Report	25%	Writing a real-world case study
Team Presentation 2 (Final Pitch)	10%	Final case study presentation

Curricula Integration

- The module will be piloted at AzUAC in the MSc in Emergencies and Health & Safety Engineering.
- Available for students from partner universities in Azerbaijan and beyond.
- Can be incorporated as an elective or core course within digital transformation and OSH curricula.

Quality Assurance & Evaluation

- Evaluation Methods: Surveys, peer reviews, and pilot program feedback.
- Quality Assurance: Compliance with EQF Level 7 standards, accreditation reviews.
- Continuous Improvement: Industry expert feedback, curriculum revision based on pilot outcomes.

Change History & Ownership: Change History & Ownership

Version	Product Owner	Date of Release	Remarks
0.1	Isa Muradov	31.03.2021	Initial draft for OpenCoP review
0.2	Kanan Hasanov	07.11.2021	Revised based on project quality board feedback
0.3	Kanan Hasanov	19.02.2022	Updated after review by Carsten Wolff

Table of Content

2 Introduction to the module

1. Overview: Safe Workplaces

The workplace is undergoing a **digital revolution** driven by **Industry 4.0**, which integrates **automation, artificial intelligence (AI), the Internet of Things (IoT), robotics, big data analytics, and cloud computing** into industrial and office environments. This transformation promises **increased productivity, efficiency, and flexibility** but also introduces **new occupational safety and health (OSH) risks**.

As organizations adopt **smart factories, automated systems, remote work environments, and data-driven decision-making**, they must also address **cybersecurity risks, ergonomic concerns, digital stress, and evolving regulatory frameworks**. This module explores how organizations can maintain **safe and healthy workplaces** while leveraging digital transformation for sustainable growth.

2. Why Is This Module Important?

The integration of **digital technologies** in the workplace is creating **both opportunities and challenges** for safety professionals. Key concerns include:

- **Human-robot interaction**: How to ensure workplace safety in environments where humans and robots work side by side.
- **Remote work ergonomics**: Managing mental and physical health risks associated with telecommuting.
- **Cybersecurity & data protection**: Preventing unauthorized access to sensitive worker and organizational data.
- **Psychosocial risks**: Addressing the increased stress, burnout, and mental health issues resulting from hyper-connectivity.
- **Legal & regulatory frameworks**: Updating OSH laws and policies to accommodate **emerging work models**.

This module **equips learners** with **theoretical knowledge, risk assessment methodologies, digital OSH tools, and strategic safety management frameworks** to address these concerns.

3. Industry 4.0 and Workplace Safety

What is Industry 4.0? How Did This Trend Develop?

Industry 4.0, also known as the **Fourth Industrial Revolution**, represents a **shift towards smart automation and data-driven processes** in industries. It builds upon previous industrial revolutions:

1. **Industry 1.0** – Mechanization through water and steam power.
2. **Industry 2.0** – Mass production using electricity.
3. **Industry 3.0** – Automation through computers and electronics.

4. **Industry 4.0** – Smart automation using AI, IoT, and real-time data.

With the rise of **smart factories, cyber-physical systems, digital twins, and predictive analytics**, workplaces are **increasingly interconnected**, requiring a **new approach to occupational safety**.

What Topics Are Behind Industry 4.0?

Industry 4.0 is **multidisciplinary**, combining:

- **Economic Aspects**: Digital transformation drives productivity, cost savings, and new business models.
- **Technological Advances**: AI, IoT, cloud computing, blockchain, cybersecurity, and robotics shape modern workspaces.
- **Organizational & Change Management**: Businesses must adopt agile strategies to manage workforce transformation.
- **Workforce & OSH Considerations**: As automation replaces manual tasks, new roles emerge, requiring **upskilling and reskilling**.

What Are the Key Sources of Information?

For continuous learning, students should explore:

- **EU-OSHA reports on digitalization and workplace safety**.
- **ISO 45001: Occupational Health and Safety Standards**.
- **Scientific research on AI-driven safety systems**.
- **Case studies from leading Industry 4.0 companies**.

The module will integrate **academic literature, real-world case studies, and best practices** from digital safety pioneers.

4. Who Should Learn This? What Competencies Are Needed?

This module is tailored for:

- **Master's students** in Engineering, IT, Business, Project Management, Occupational Safety, and related fields.
- **OSH professionals** seeking to modernize their safety strategies.
- **Industry leaders** responsible for implementing workplace safety policies.
- **Researchers & policymakers** analyzing the impact of digital transformation on OSH.

Key Competencies Required:

To effectively manage OSH in the digital era, professionals must develop:

1. **Technical Knowledge**: Understanding AI, IoT, and data-driven safety systems.

2. **Risk Management Skills**: Identifying, assessing, and mitigating digital workplace hazards.
3. **Cybersecurity Awareness**: Protecting worker data and ensuring safe IT infrastructures.
4. **Human-Centered Safety Approaches**: Balancing efficiency with **mental and physical well-being**.
5. **Regulatory & Ethical Understanding**: Compliance with evolving OSH policies.

The labor market demands **professionals who can integrate OSH into digital workspaces**—this module prepares learners for **future-proof careers**.

5. Contribution from the Community of Practice

This module is part of **WORK4CE**, a **collaborative effort** bringing together universities, industry experts, and policymakers. The **Open Community of Practice (OpenCoP)** facilitates **knowledge-sharing and innovation** in OSH digital transformation.

Through this module, students will engage with:

- **Case studies from industry partners**.
- **Guest lectures from OSH experts in digital transformation**.
- **Hands-on projects using digital safety tools**.

By participating, students **become part of a global movement** advocating for **safe, human-centered workplaces** in the Industry 4.0 era.

3.1 Overall Learning Outcomes

This module is designed to equip learners with the necessary knowledge, skills, and competencies to address occupational safety and health (OSH) challenges in digitized workplaces. By integrating theoretical insights, technological applications, and hands-on practice, students will develop a comprehensive understanding of workplace safety in the context of Industry 4.0.

Learning Outcomes Framework (EQF)

Following the European Qualification Framework (EQF Level 7 – Master's Level), the learning outcomes of this module are categorized into:

- Knowledge (Theoretical and Factual Understanding)
- Skills (Cognitive & Practical Application)
- Competence (Responsibility & Autonomy in Work and Study Contexts)

Knowledge

Upon successful completion of this module, learners will:

✅ Understand the fundamental principles of occupational safety and health (OSH).

✅ Explain traditional OSH frameworks, including international safety standards (ISO 45001, EU-OSHA, ILO guidelines).

✅ Analyze the impact of Industry 4.0 technologies on workplace safety (robotics, AI, IoT, wearables, cybersecurity risks).

✅ Identify key psychosocial risks, including stress, mental well-being, and human-machine interaction challenges.

✅ Examine the ethical and regulatory implications of digital workplace monitoring, employee surveillance, and data protection laws.

Skills

Upon successful completion of this module, learners will be able to:

🔷 Apply risk assessment techniques to evaluate digital workplace hazards.

🔷 Develop safe workplace policies integrating digital tools and AI-driven safety measures.

🔷 Utilize digital safety tools such as VR simulations, AI-driven monitoring, and predictive analytics for OSH.

🔷 Assess cybersecurity risks related to cloud-based OSH management systems and employee data protection.

🔷 Implement ergonomic best practices for remote and hybrid workplaces.

🔷 Lead safety training sessions using digital learning methods (e-learning, gamification, virtual workshops).

Competence (Responsibility & Autonomy)

By the end of this module, students will be capable of:

✳️ Managing OSH policies in complex, digitally transformed workplaces.

✳️ Leading risk assessments and OSH audits in Industry 4.0 environments.

✳️ Transforming research insights into practical OSH improvements in the workplace.

✳️ Developing organizational strategies to foster a human-centered safety culture.

✳️ Collaborating with cross-disciplinary teams to implement OSH frameworks in global organizations.

Overarching Learning Outcomes (OLO) - Cross-Domain Competencies

This module incorporates EIT Overarching Learning Outcomes (OLOs) to ensure a well-rounded competency profile:

✅ Value Judgments & Sustainability (OLO 1)

➞ Ability to anticipate the long-term effects of digital safety policies on employees and organizations.

✅ Entrepreneurship (OLO 2)

➞ Ability to develop innovative safety solutions (e.g., AI-driven OSH monitoring, smart wearables for injury prevention).

✅ Creativity (OLO 3)

➞ Ability to think outside the box and design new safety protocols for hybrid and remote work environments.

✅ Innovation (OLO 4)

➞ Ability to implement novel OSH solutions using emerging technologies like VR safety training, blockchain for compliance tracking, and IoT-based risk monitoring.

✅ Research Skills (OLO 5)

➞ Ability to conduct data-driven analysis to improve OSH strategies in digital workplaces.

✅ Intellectual Transformation (OLO 6)

➞ Ability to convert practical OSH challenges into research questions and industry solutions.

✅ Leadership (OLO 7)

➞ Ability to lead OSH teams, train employees, and develop safety-first workplace cultures.

Connection to Module Philosophy & Learning Experience

This module follows a scientific and practical approach, integrating:

- Theoretical knowledge through lectures, academic literature, and case studies.
- Hands-on, project-based learning through real-world case studies, simulations, and interactive workshops.
- Entrepreneurial thinking by challenging students to develop innovative safety solutions for digital workplaces.
- Industry engagement through collaboration with external OSH professionals, companies, and policymakers.

This ensures that learners develop both core technical skills and broader leadership capabilities in occupational safety for Industry 4.0.

3.2 Target Group Analysis

The **Safe Workplaces** module is designed for a diverse range of learners, including **students, professionals, and industry stakeholders** involved in occupational safety and health (OSH), digital transformation, and risk management. The target groups have been categorized based on **their characteristics, prerequisites, learning needs, and career prospects**.

1. Master's Students & Early-Career Professionals

Characteristics:

- Enrolled in **Master's programs** related to **Engineering, Computer Science, IT, Project Management, Business Administration, Digital Transformation, and Occupational Safety**.
- Early-career professionals who need to **develop expertise in digital OSH strategies**.
- Likely to work in industries such as **manufacturing, logistics, healthcare, construction, and IT-driven workplaces**.

Previous Competence & Prerequisites:

- Basic knowledge of **health and safety principles**, engineering, or business administration.
- Familiarity with **digital tools and workplace technologies** (e.g., office software, IoT, automation).

- Understanding of **general workplace risks and safety culture**.

Needs:

- A **structured, academic approach** with **theoretical learning, case studies, and digital OSH applications**.
- Access to **e-learning resources**, **interactive tools**, and **virtual simulations** for workplace safety.
- Training in **data-driven decision-making for workplace safety management**.

Competence Goals:

- Develop **technical and professional competencies in OSH and digital transformation**.
- Gain **risk assessment skills** for digitalized workplaces.
- Learn to **apply AI-driven monitoring, VR-based safety training, and predictive analytics for OSH**.

Prospective Job Fields:

- OSH Management
- Workplace Safety Consulting
- Digital Risk Assessment & Compliance
- Industry 4.0 Safety Specialist
- Research & Development in OSH

2. Occupational Safety & Health (OSH) Professionals

Characteristics:

- Mid-career **safety officers, engineers, and HR professionals** responsible for OSH in organizations.
- Employees in **manufacturing, logistics, healthcare, IT, and digital industries** seeking to integrate **modern safety solutions**.

Previous Competence & Prerequisites:

- **Experience in workplace safety** but limited exposure to **digital transformation tools**.
- Familiarity with **OSH regulations (ISO 45001, EU-OSHA, ILO standards)**.
- Some understanding of **risk management strategies**.

Needs:

- **Hands-on training** in **digital safety tools, AI-driven monitoring, and cybersecurity for OSH**.
- **Workshops on implementing new safety technologies in industrial and corporate settings**.
- **Flexible learning formats** (e.g., online courses, weekend workshops).

Competence Goals:

- Ability to **assess and mitigate emerging workplace hazards in digital industries**.
- Understanding of **new regulatory frameworks for digital workplace safety**.
- Proficiency in using **predictive analytics, IoT sensors, and AI-assisted monitoring** for risk prevention.

Prospective Job Fields:

- Corporate OSH Manager
- Risk & Compliance Officer
- Digital Safety Consultant
- Safety Data Analyst
- Workplace Ergonomics Specialist

3. Industry Leaders & Policymakers

Characteristics:

- Senior **executives, decision-makers, and policymakers** in charge of **workplace safety regulations and corporate OSH policies**.
- Leaders of **large enterprises, SMEs, and governmental agencies** seeking to adapt to **digital safety standards**.

Previous Competence & Prerequisites:

- **Strong managerial background** but limited **technical knowledge** of digital safety innovations.
- Experience with **safety policy development, compliance, and regulatory enforcement**.

Needs:

- **Executive briefings and training sessions** on the **future of OSH in Industry 4.0**.
- **Legal and regulatory insights** into **emerging safety laws and compliance requirements**.
- **Networking opportunities** with OSH experts, industry practitioners, and academia.

Competence Goals:

- Ability to **develop and implement strategic OSH policies for digital workplaces**.
- Capacity to **evaluate the impact of AI, automation, and IoT on worker safety**.
- Skills to **integrate OSH into corporate ESG (Environmental, Social, Governance) strategies**.

Prospective Job Fields:

- Chief OSH Officer
- Workplace Safety Regulator
- Public Policy Advisor
- Corporate Risk Management Director
- ESG & Sustainability Consultant

4. Researchers & Educators

Characteristics:

- **University professors, PhD students, and independent researchers** focused on **occupational safety, human-machine interaction, and digital transformation**.
- Experts in **OSH pedagogy and training**.
- **Previous Competence & Prerequisites:**

- **Strong academic background** in workplace safety, business management, or digital innovation.
- Experience in **teaching OSH-related courses or conducting research on Industry 4.0**.

Needs:

- **Access to the latest research and case studies** on digital OSH.
- Collaboration with **industry partners** for data collection and applied research.
- Participation in **knowledge-sharing platforms and international OSH forums**.

Competence Goals:

- Ability to **contribute to cutting-edge research in OSH and digital safety**.
- Development of **new teaching methodologies for OSH in the digital era**.
- Creation of **open-source learning materials and digital safety curricula**.

Prospective Job Fields:

- University Lecturer in OSH & Digital Safety
- Researcher in Human-Machine Interaction
- OSH Training Program Developer
- Policy Researcher in Workplace Digitalization

Summary of Target Groups

Target Group	Characteristics	Competence Goals	Prospective Job Fields
Master's Students & Early-Career Professionals	MSc students in Engineering, IT, Business, OSH	Develop OSH strategies for digital workplaces	OSH Manager, Risk & Compliance Analyst, Industry 4.0 Safety Consultant
OSH Professionals	Safety officers, HR, engineers in industry	Implement AI-driven monitoring, predictive analytics for safety	Corporate Safety Manager, Digital Risk Assessor, Workplace Ergonomics Specialist

Industry Leaders & Policymakers	Executives, policymakers in workplace safety	Develop policies for digital workplace safety	Chief OSH Officer, Public Policy Advisor, Risk Management Director
Researchers & Educators	Professors, PhD students, OSH trainers	Conduct research on OSH in digital workplaces	OSH Lecturer, Human-Machine Interaction Researcher, Training Program Developer

3.3 Competences & Learning Outcomes

This chapter provides a detailed breakdown of the competences delivered by the Safe Workplaces module. It establishes a competence profile that students will develop upon completion of the course, structured according to the European Qualification Framework (EQF) Level 7 and European Standards and Guidelines (ESG).

Competences are categorized into:

✅ Knowledge – Theoretical and factual understanding.

✅ Skills – The ability to apply knowledge to practical and problem-solving scenarios.

✅ Competence (Responsibility & Autonomy) – The ability to apply knowledge and skills in a self-directed or leadership capacity.

These competences ensure that students acquire technical, professional, and global skills essential for safety leadership in digitalized workplaces.

Competence Breakdown Structure

Unit 1: Foundations of Occupational Safety and Health (OSH) in Digital Workplaces

Competence Goal: The student is able to **apply OSH principles in digitally evolving workplaces and assess risks in automated work environments**.

	Knowledge	**Skills**	**Competence**
a)	The student knows **international OSH standards (ISO 45001, EU-OSHA, ILO Guidelines)**	The student can **apply OSH principles in digital work environments using risk assessment frameworks**	The student is responsible for **ensuring OSH compliance and leading risk mitigation efforts**
b)	The student knows **human factors in occupational health and safety**	The student can **analyze how digital transformation impacts worker well-being (ergonomics, stress, mental health)**	The student is able to **monitor and enhance safety culture in hybrid and automated workplaces**
c)	The student understands **risk management frameworks for workplace hazards**	The student can **implement AI-driven safety monitoring and predictive analytics for hazard prevention**	The student assumes responsibility for **developing OSH strategies for smart workplaces**

Unit 2: Digital Transformation and Risk Management in OSH

Competence Goal: The student is able to **integrate Industry 4.0 technologies into occupational safety strategies and develop risk management frameworks**.

	Knowledge	Skills	Competence
a)	The student knows **how AI, automation, and robotics impact workplace safety**	The student can **design safety solutions that incorporate smart technologies and adaptive risk controls**	The student is responsible for **implementing AI-based safety monitoring systems and digital risk mitigation strategies**
b)	The student knows **cybersecurity risks related to workplace safety**	The student can **analyze vulnerabilities in OSH data protection systems**	The student ensures **compliance with cybersecurity protocols in digital safety frameworks**
c)	The student understands **ethical and legal challenges in digital OSH**	The student can **assess workplace surveillance risks and data privacy concerns**	The student is responsible for **ensuring regulatory compliance with emerging digital safety laws**

Unit 3: Workplace Ergonomics, Employee Well-Being, and Safety Culture

Competence Goal: The student is able to **develop and implement workplace safety programs prioritizing employee well-being in digitalized workplaces**.

	Knowledge	Skills	Competence
a)	The student knows **cognitive ergonomics and human-machine interaction principles**	The student can **apply ergonomic best practices to prevent workplace injuries in hybrid and automated environments**	The student is responsible for **ensuring worker safety and mental well-being in digitalized organizations**
b)	The student understands **OSH training methodologies and digital education tools**	The student can **design interactive safety training modules using AI, VR, and gamification techniques**	The student leads **OSH education initiatives and employee safety awareness programs**

Unit 4: Leadership in OSH and Strategic Decision-Making

Competence Goal: The student is able to **develop and implement OSH strategies in digitally evolving industries and provide leadership in risk management**.

	Knowledge	Skills	Competence
a)	The student knows **strategic OSH leadership models and risk assessment methodologies**	The student can **lead safety compliance programs and develop crisis management strategies**	The student is responsible for **corporate safety leadership and crisis response planning**
b)	The student understands **the role of sustainability and ESG in OSH**	The student can **integrate sustainability principles into workplace safety policies**	The student is responsible for **implementing sustainable OSH frameworks in compliance with global standards**

Overarching Learning Outcomes (OLOs) - Professional & Global Competences

Beyond technical expertise, this module integrates **Overarching Learning Outcomes (OLOs)** aligned with **European Innovation & Technology (EIT) principles**:

✅ **Value Judgments & Sustainability (OLO 1)**

➞ Ability to **evaluate long-term safety impacts of digital workplace policies** and **implement sustainable OSH practices**.

✅ **Entrepreneurship (OLO 2)**

➞ Ability to **develop innovative workplace safety solutions leveraging digital tools and automation**.

✅ **Creativity (OLO 3)**

➞ Ability to **design human-centered safety innovations to improve digital work environments**.

✅ **Innovation (OLO 4)**

➞ Ability to **apply emerging technologies (IoT, AI, VR) to enhance workplace safety and training**.

✅ **Research Skills (OLO 5)**

➞ Ability to **conduct empirical research on digital OSH trends and publish findings in academic and professional settings**.

✅ **Intellectual Transformation (OLO 6)**

➞ Ability to **translate workplace safety challenges into scientific research and policy recommendations**.

✅ **Leadership (OLO 7)**

➞ Ability to **lead teams in safety decision-making and crisis management within digital workspaces**.

Assessment Considerations

Competences in this module are structured to allow for **quantifiable evaluation**. Each **learning outcome** is measurable through:

- **Knowledge-based assessments**: Written/oral exams, research papers.
- **Skill-based evaluations**: Case studies, practical assignments.
- **Competence-based assessments**: Project leadership, OSH policy implementation exercises.

This ensures that students can **demonstrate mastery of OSH strategies** in **digitalized workplaces** while adhering to **EQF Level 7 professional standards**.

3.4 Content

The **Safe Workplaces** module covers a comprehensive range of topics related to **occupational safety and health (OSH) in digital workplaces**, with a strong emphasis on **Industry 4.0, AI-driven risk assessment, and digital transformation in safety management**. The module content is designed to provide **theoretical knowledge, practical skills, and strategic competencies** needed for professionals managing safety in **modern, technology-driven work environments**.

Thematic Content Overview

The module is divided into **four main thematic areas**, each addressing a **key aspect of digital workplace safety**.

1. Foundations of Occupational Safety and Health (OSH) in Digital Workplaces

📌 **Objective:** Establish fundamental OSH principles and their role in digital workplaces.

🔷 Introduction to **occupational health and safety (OSH) regulations and international standards** (ISO 45001, EU-OSHA, ILO Guidelines).

🔷 Historical evolution of **workplace safety and its transformation in the digital age**.

🔷 **Human factors in OSH**: Understanding cognitive ergonomics, worker behavior, and safety culture.

🔷 Risk management frameworks: **Identifying, assessing, and mitigating workplace hazards**.

2. Digital Transformation & OSH Risk Management

📌 **Objective:** Understand the challenges and opportunities of Industry 4.0 technologies in OSH.

🔷 **Impact of AI, IoT, and automation on workplace safety**.

🔷 OSH risk management in **smart factories, AI-driven processes, and robotics integration**.

🔷 Cybersecurity risks in OSH: **Protecting employee data and preventing digital OSH vulnerabilities**.

🔷 Ethical and legal challenges: **Digital workplace monitoring, AI-driven performance tracking, and privacy concerns**.

3. Workplace Ergonomics, Employee Well-Being & Safety Culture

📌 **Objective:** Develop strategies for worker well-being and mental health in digitalized workspaces.

🔷 **Psychosocial risks in digital workplaces**: Stress, burnout, and cognitive overload.

🔷 **Ergonomics in hybrid and remote work environments**: Preventing digital fatigue.

🔷 **Training and awareness programs**: Using VR, AR, and gamification for OSH education.

🔷 **Developing a human-centered safety culture** in Industry 4.0 organizations.

4. Leadership in OSH & Strategic Decision-Making

📌 **Objective:** Enable safety professionals to lead risk management initiatives and OSH policy development.

🔷 **Strategic OSH leadership**: Managing workplace safety in highly automated industries.

🔷 **Crisis management and emergency response planning** in digital workplaces.

🔷 **Sustainability and ESG (Environmental, Social, and Governance) considerations in OSH**.

🔷 **OSH compliance and governance frameworks**: Aligning with national and international safety regulations.

Elective & Specialized Topics

📌 **These elective components provide flexibility based on learner interests and industry needs:**

✅ **OSH in Virtual Teams & Remote Workplaces**

- Managing occupational health in **remote and hybrid work environments**.
- Ensuring **psychological safety and digital well-being**.

✅ **OSH in Automated & AI-Driven Industries**

- **Workplace safety in robotics and AI-driven environments**.
- Implementing **predictive analytics for accident prevention**.

✅ **Cybersecurity & Digital OSH Risks**

- Addressing **data protection and workplace surveillance challenges**.
- **Mitigating cyber risks in smart factories and cloud-based OSH systems**.

✅ **Regulatory Compliance & Ethical Workplace Monitoring**

- Adapting to **emerging OSH policies in digital workplaces**.
- Ethical concerns in **AI-based employee tracking and performance assessment**.

3.5 Teaching & Learning Activity Plan

The **Safe Workplaces** module integrates **diverse didactic approaches** to ensure a **competency-based learning model**. This structure allows students to gain **knowledge, practical skills, and scientific research capabilities**, following a **blended learning approach**.

A) Teaching & Learning Methods per Competence

The module follows **three core learning formats**, each aligned with a **specific competence area**:

Competence Area	Learning Outcome	Main Teaching Format
Knowledge Acquisition	Understanding of **OSH principles, digital transformation, and risk management**	**eLearning (Online Courses, Virtual Lectures, Self-Learning Modules)**
Practical Skills Development	Application of OSH principles in **Industry 4.0 environments**	**Workshops, Industry Projects, Case Studies**
Scientific & Research Work	Critical thinking, **scientific writing, and innovation in OSH strategies**	**Individual Research, Report Writing, Scientific Publications**

This **structured format ensures** that students engage with **theory, hands-on application, and scientific exploration**.

B) Didactic Concept

The **blended learning approach** integrates **various learning methodologies**, ensuring an **engaging, interactive, and practical education model**.

1. Theoretical Knowledge (Self-Learning)

📌 **Objective:** Build foundational knowledge of **OSH, risk management, and digital workplace safety**.

📄 **Methods:**

- Online learning modules (self-paced)
- Virtual lectures (live & recorded)
- eBooks, research papers, and OSH guidelines
- Distance learning platforms (Moodle, Microsoft Teams)

📝 **Main Format: eLearning**

2. Practical Skills (Hands-On, Project-Based Learning)

📌 **Objective:** Develop applied OSH skills through **real-world projects and interactive workshops**.

🛠 **Methods:**

- Training sessions on **OSH digital tools**

- **Industry-linked projects** with case studies
- **Virtual Reality (VR) simulations** for safety training and risk assessment
- **Internships or field visits** to OSH-compliant workplaces

📝 **Main Format: Workshops & Project-Based Learning**

3. Scientific Work (Research & Innovation)

📌 **Objective:** Develop **critical thinking** and **scientific research skills** in **OSH and Industry 4.0**.

📚 **Methods:**

- **Individual research projects** on OSH challenges
- **Case study writing** on AI-driven safety solutions
- **Scientific publication & peer-reviewed reports**
- **Paper & colloquium presentations**

📝 **Main Format: Scientific Contribution & Research**

C) Activity Plan – Semester Structure

The **semester plan** is designed around **progressive learning phases**, moving from **theory to hands-on work and research**.

Week	Activity	Competence Area
Week 1-4	**Theory classes & eLearning modules** (OSH regulations, Industry 4.0 safety)	**Knowledge**
Week 5-7	**Team-based project work & workshops** (OSH digital tools & risk management)	**Skills**
Week 8-10	**Industry collaboration & simulations** (case studies, safety audits, VR exercises)	**Skills & Competence**
Week 11-13	**Research project development** (OSH policy recommendations, innovation in safety)	**Scientific Work**
Week 14	**Paper writing & preparation for presentations**	**Competence**
Week 15	**Final scientific presentation & project evaluations**	**Competence**

This **structured semester model** ensures that students **progress from theoretical knowledge to applied skills and independent research**.

Predefined Student Journeys & Learning Trajectories

To provide **tailored learning experiences**, the module offers **three predefined student journeys**, allowing students to specialize based on their **career interests**.

Student Track	Focus	Tailored Learning Path
Practical Track	Industry-based application	Emphasis on **workshops, internships, and hands-on risk assessments**
Entrepreneurial Track	Innovation in OSH solutions	Focus on **startup-driven safety innovations and AI-based monitoring**
Scientific Track	Research & academia	Intensive **research, scientific paper writing, and conference participation**

This approach ensures that students **gain relevant expertise based on their career paths** while maintaining a **strong foundation in OSH principles**.

3.6 Teaching & Learning Resources

This section outlines the **literature, media, technical requirements, and IT tools** necessary for delivering the **Safe Workplaces** module. The module leverages a **blended learning environment**, requiring a mix of **digital resources, practical tools, and interactive learning platforms**.

A) Required Literature & Media

The module incorporates **academic literature, OSH guidelines, and industry case studies** to provide students with **comprehensive knowledge**.

Core Textbooks & Standards:

📖 **International OSH Standards & Regulations**

- **ISO 45001** – Occupational Health and Safety Management Systems
- **EU-OSHA Reports & Guidelines**
- **ILO Occupational Safety and Health Conventions**

📖 **Key Books & Publications**

- **Digital Transformation and Occupational Safety** – Current Research
- **Workplace Safety in Industry 4.0: Challenges and Innovations**

- **Ergonomics & Cognitive Workload in Hybrid Environments**

📖 **Scientific & Research Papers**

- Selected **peer-reviewed articles from Scopus & Web of Science journals**
- **Case studies on AI-driven OSH solutions**

📖 **Supplementary Learning Materials**

- **White papers on automation, robotics, and OSH**
- **Industry reports from leading workplace safety organizations**

B) Media & Digital Learning Resources

The module integrates **modern digital tools** for interactive learning and practical skill development.

🎥 **Video Lectures & Webinars**

- **OSH regulatory updates**
- **AI & IoT applications in workplace safety**

🎓 **E-Learning Platforms**

- **Moodle (Mandatory LMS)**
- **LinkedIn Learning for OSH courses**

📊 **Case Study Repositories**

- **OSH digital transformation case library**
- **Best practices from leading organizations**

📱 **Simulation & Virtual Reality (VR) Training**

- **Virtual workplace risk assessment scenarios**
- **AI-based safety monitoring demonstrations**

C) Technical Requirements & Lab Equipment

To ensure a **hands-on learning experience**, the module requires access to **technical tools and lab equipment**.

1. Software & Digital Tools

🔷 **LMS (Mandatory: Moodle)** – For content delivery, assignments, and exams.

🔷 **OSH Risk Assessment Software** – SafetyCulture, iAuditor, etc.

🔹 **Data Analytics for Safety Reports** – Power BI, Tableau.
🔹 **VR & AR Safety Simulations** – Oculus-based training modules.
🔹 **AI-based Workplace Safety Monitoring Systems** – Predictive analytics software.

2. Lab Equipment & Practical Training Needs

🛠 **Ergonomic Workstations** – For hands-on assessment of workplace ergonomics.
🛠 **Wearable Safety Devices** – Smart helmets, motion sensors for real-world testing.
🛠 **IoT-enabled Work Safety Systems** – Testing sensor-based safety interventions.

D) Learning Management System (LMS) & IT Infrastructure

The module will be managed through a **centralized LMS (Moodle)**, ensuring **structured learning, assessments, and collaboration**.

Platform/Tool	Purpose
Moodle (Mandatory LMS)	Course content, quizzes, assignments, student progress tracking
Microsoft Teams/Zoom	Virtual lectures, discussions, and interactive sessions
VR Simulation Tools (Oculus, Unity-based training)	Hands-on workplace safety training
OSH Compliance Software (ISO 45001 tools)	Practical risk assessment exercises
Research Databases (Scopus, Web of Science, Google Scholar)	Access to scientific research for assignments

3.7 Tailoring & Educational Tracks

The **Safe Workplaces** module is designed with **flexibility** to cater to different **learning objectives, career paths, and target groups**. The module can be tailored across **three educational tracks** to accommodate **students, professionals, entrepreneurs, and researchers**.

A) Tailoring Options in Module Design

The module can be **customized based on ECTS credits, target groups, and focus areas**, ensuring a **personalized learning experience**.

Tailoring Option	Description
Range of ECTS	**4-8 ECTS**, depending on depth and workload.
Target Groups	**Students, professionals, industry leaders, policymakers, researchers**.
Learning Approach	**Theoretical, applied, and research-based tracks**.
Customization	**Hands-on training, project-based learning, or academic research focus**.

B) Educational Tracks

Students can choose between **three predefined tracks** based on their **career aspirations**:

1) Practical Track (Industry-Oriented)

✅ **Focus:** Hands-on workplace safety implementation, industry partnerships, and compliance strategies.

✅ **Target Audience:** OSH professionals, workplace safety officers, HR personnel, engineers.

✅ **Key Learning Methods:**

- **Workshops & Industry Case Studies**
- **Risk Assessment & OSH Audits**
- **VR-based Safety Simulations**
- **Internships & On-Site Safety Evaluations**

✅ **Career Relevance:**

- **Corporate Safety Manager**
- **Risk & Compliance Officer**
- **OSH Specialist in Manufacturing & Logistics**

📌 **ECTS: 4-6 (Emphasis on practical application)**

2) Entrepreneurial Track (Innovation & Business in OSH)

✅ **Focus:** Developing innovative safety solutions, OSH startups, and AI-driven monitoring technologies.

✅ **Target Audience:** Entrepreneurs, business leaders, OSH consultants, digital safety solution developers.

✅ **Key Learning Methods:**

- **Business Model Development for OSH Startups**
- **AI-driven Workplace Safety Innovation**
- **Industry 4.0 & Smart OSH Solutions**
- **Pitching OSH Tech Solutions to Investors**

✅ **Career Relevance:**

- **Founder of OSH Tech Startup**
- **Safety Innovation Consultant**
- **Digital Risk Management Entrepreneur**

📌 **ECTS: 6-8 (Emphasis on innovation & business models)**

3) Scientific Track (Academic & Research Focus)

✅ **Focus:** Conducting empirical research, publishing in academic journals, and advancing OSH policy frameworks.

✅ **Target Audience:** MSc & PhD students, academic researchers, policymakers in OSH.

✅ **Key Learning Methods:**

- **Systematic Literature Reviews & Empirical Studies**
- **OSH Data Analytics & Policy Development**
- **Writing & Publishing Peer-Reviewed Research Papers**
- **Participation in OSH Conferences & Academic Seminars**

✅ **Career Relevance:**

- **University Lecturer & Researcher in OSH**
- **Policy Analyst in Government & NGOs**
- **OSH Compliance & Regulatory Expert**

📌 **ECTS: 6-8 (Emphasis on academic research & policy impact)**

C) Summary of Tailoring Options

Track	Target Audience	Main Learning Activities	ECTS Range
Practical Track	Industry professionals & OSH officers	Hands-on risk assessments, VR safety training, compliance audits	**4-6 ECTS**
Entrepreneurial Track	Startups, business leaders	AI-driven OSH innovations, pitching & business modeling	**6-8 ECTS**
Scientific Track	MSc & PhD students, researchers	Academic research, policy recommendations, peer-reviewed publications	**6-8 ECTS**

3.8 Assessment Methods

The **Safe Workplaces** module incorporates a **variety of assessment methods** to evaluate **theoretical knowledge, practical skills, and research competencies**. The assessment strategy includes **written exams, project-based evaluations, self-assessment, and peer-assessment**, ensuring a **comprehensive evaluation** of students' learning outcomes.

A) Assessment Types

The module integrates the following **assessment formats**:

Assessment Type	Description	Competence Evaluated
Written Exam	Tests theoretical knowledge of OSH principles, risk management, and digital transformation	**Knowledge**
Homework & Assignments	Individual or group assignments on OSH case studies and digital workplace safety strategies	**Knowledge & Skills**
Practical Risk Assessment Project	Hands-on workplace risk assessment using digital tools (AI, IoT, VR simulations)	**Skills & Competence**
Team-Based Project Work	Group collaboration on an OSH innovation challenge	**Skills (Problem-Solving, Leadership)**

Scientific Paper & Report	Research-based assessment, including literature review and OSH strategy proposal	**Competence (Scientific & Critical Thinking)**
Peer & Self-Assessment	Reflection on team contributions and self-evaluation of progress	**Competence (Autonomy & Responsibility)**
Final Presentation & Defense	Presentation of research findings, risk assessments, or entrepreneurial solutions	**Competence (Communication & Leadership)**

B) Assessment Breakdown & Weighting

FORM	%	REMARK
Written Exam	**30%**	Based on **theory classes & OSH regulatory knowledge**
Homework & Individual Assignments	**20%**	Research-based **OSH case studies & compliance assessments**
Practical Risk Assessment Project	**20%**	Evaluation of **hands-on digital safety tools (AI, VR, IoT)**
Team-Based Project Work (OSH Innovation Challenge)	**10%**	Presentation of **team-developed OSH solutions**
Scientific Paper or Policy Report	**10%**	Research contribution to **OSH digital transformation**
Final Presentation & Defense	**10%**	Oral presentation of **project results, risk evaluations, or startup solutions**

C) Self-Assessment & Peer-Assessment

Students will engage in **self-reflection and peer evaluations** to **enhance critical thinking, teamwork, and self-improvement**.

✅ **Self-Assessment:**

- Reflection on individual learning progress.
- Evaluating personal contributions to team projects.
- Identifying areas for improvement.

✅ **Peer-Assessment:**

- Evaluating contributions of **team members**.
- Providing constructive feedback on **team projects and presentations**.
- Enhancing **collaboration and accountability**.

3.9 Curricula Integration

The **Safe Workplaces** module is designed to be **flexibly integrated** into various **academic programs and professional training pathways**. It can be included as a **standalone course, elective, minor specialization, or professional certification module**.

A) Study Programmes for Integration

The module can be embedded into multiple **Master's, PhD, and Professional Development Programs** related to **Occupational Safety, Digital Transformation, and Industry 4.0**.

Recommended Study Programs:

Field of Study	Degree Level	Integration Possibilities
Occupational Safety & Health (OSH)	MSc, PhD	**Core module or elective in safety engineering and risk management programs**
Engineering (Industrial, Mechanical, Electrical, Digital)	MSc, PhD	**Elective or specialization in Industry 4.0 and smart workplace safety**
Computer Science & AI	MSc	**Elective in AI-driven safety systems & cybersecurity risk assessment**
Business Administration & Management	MSc, MBA	**Module on corporate safety strategies & compliance management**
Human Resource Management (HRM)	MSc	**Elective in workplace safety culture, employee well-being, and ergonomics**

B) How to Integrate into the Curriculum

The module offers **multiple integration options**, allowing universities and institutions to adapt it based on their curriculum needs.

Integration Approaches

Integration Method	Description	ECTS Range
Standalone Elective	Can be taken as a single **4-8 ECTS** elective course within MSc/PhD programs.	**4-8 ECTS**
Minor Specialization	Forms part of an **interdisciplinary minor** (e.g., "Digital Safety & Compliance").	**6-12 ECTS**
Mandatory Core Module	Integrated as a **compulsory component** of OSH and risk management degrees.	**6-8 ECTS**
Interdisciplinary Collaboration	Offered as a **cross-departmental module** (e.g., OSH + AI).	**4-6 ECTS**
Professional Certification	Can be **certified as a micro-credential for industry professionals**.	**3-6 ECTS**

C) Educational Packages & Minor Specializations

The module can be part of an **educational package**, providing a **structured pathway for students specializing in workplace safety**.

Example Educational Packages:

1) **Digital OSH & Industry 4.0 (Minor, 12 ECTS)**

- Safe Workplaces Module (6 ECTS)
- AI & IoT in Workplace Safety (3 ECTS)
- Ergonomics & Employee Well-Being (3 ECTS)

2) **OSH Leadership & Policy (Minor, 12 ECTS)**

- Risk & Compliance Management (6 ECTS)
- Global Safety Regulations & Standards (3 ECTS)
- Sustainable Safety Culture in Organizations (3 ECTS)

3) **Professional Training Track (6 ECTS)**

- Online training course + certification exam
- Industry case studies & compliance audits

D) Industry & Lifelong Learning Integration

The module is also suitable for **professional development and lifelong learning**, allowing **industry professionals, HR leaders, and policymakers** to upgrade their OSH competencies.

Delivery Formats for Industry Learners:

- **Corporate Training Modules** (Online, Hybrid, In-Person)
- **Weekend or Executive Courses** (for working professionals)
- **Micro-Credential Certifications**

3.10 Quality Assurance - Evaluation

3.10.1 Quality assurance

The **Safe Workplaces** module follows a structured **quality assurance process** to ensure **continuous improvement, alignment with learning outcomes, and effectiveness in knowledge transfer**. The module will be evaluated using a combination of **student feedback, performance assessments, and external expert reviews**.

A) Quality Assurance Strategy

The quality of the module will be assessed based on **three key aspects**:

- ✅ **Effectiveness of Learning Outcomes** – Ensuring students achieve the expected competences.
  ✅ **Relevance of Content & Teaching Methods** – Evaluating the applicability of OSH principles in digital workplaces.
  ✅ **Student Engagement & Satisfaction** – Measuring engagement levels and effectiveness of learning formats.

B) Quality Assessment Timeline & Methods

Phase	When	Method	Purpose
Formative Assessment	**After Each Lesson**	**Short student feedback surveys**	Measure immediate understanding and course engagement
Mid-Course Evaluation	**Week 7-8**	**Mid-term surveys & focus groups**	Identify early issues in teaching methods and content delivery
Final Course Evaluation	**End of Course (Week 15)**	**Comprehensive student survey + Instructor Reflection Log**	Assess overall course effectiveness and student satisfaction
Competence-Based Evaluation	**After Final Presentation & Assessments**	**Student performance analytics (exam results, project scores, peer reviews)**	Ensure achievement of intended learning outcomes
Alumni & Industry Feedback	**3-6 months after course completion**	**Follow-up surveys with graduates & industry partners**	Evaluate long-term impact and industry relevance

C) Quality Assessment Tools & Techniques

1. Surveys & Student Feedback

📋 **After Each Lesson:**

Quick **5-minute surveys** to assess clarity, engagement, and challenges.

Digital polls via **Moodle or Google Forms**.

📋 **Mid-Course & Final Surveys:**

Structured questionnaires on **teaching effectiveness, materials, and course design**.

Open-ended feedback on **student learning experiences**.

2. Portfolio & Competency-Based Assessment

📂 **Student Portfolio:**

Compilation of **projects, case studies, and research work**.

Reflection logs on **learning progress and application of OSH concepts**.

📂 **Competency-Based Grading:**

Performance tracking based on **exam results, project submissions, and peer assessments**.

Evaluation of **individual and group contributions to practical safety assessments**.

3. Instructor Reflection & Peer Review

📖 **Instructor Logbook:**

Weekly self-assessment by instructors on **course delivery, student engagement, and challenges**.

Documentation of **best practices and areas for improvement**.

👥 **Peer Review of Teaching:**

Faculty and external OSH professionals **observe lectures and provide feedback**.

Benchmarking against **best practices in digital safety training**.

4. External Validation & Industry Feedback

🏢 **Industry Partner Evaluations:**

Companies that participate in **internships, case studies, or mentorship programs** will **provide structured feedback** on student performance.

🎓 **Alumni Feedback:**

Post-course survey (3-6 months later) to assess **real-world application of acquired skills**.

📊 **Benchmarking Against Accreditation Standards:**

Regular alignment with **EU-OSHA, ISO 45001, and higher education accreditation frameworks**.

D) Continuous Improvement Process

The module will follow a **Plan-Do-Check-Act (PDCA) Cycle** for continuous enhancement:

1) **Plan:** Set clear **learning objectives and assessment criteria** at the start of each semester.

2)**Do:** Deliver the module using **blended learning approaches**.

3) **Check:** Collect data from **student surveys, instructor reflections, and industry evaluations**.

4) **Act:** Revise **content, methods, and materials** based on feedback for future iterations.

3.10.2 Evaluation

The evaluation process ensures that the **Safe Workplaces** module remains **effective, engaging, and up to date** by incorporating **student feedback, instructor reflections, and industry input**. Evaluations will guide **continuous improvements in student learning, teaching methods, and course content**.

A) Evaluation Criteria & Areas for Improvement

The module evaluation will focus on **three key areas**:

Evaluation Focus	Objective	Key Metrics & Actions
Student Learning	Improve knowledge retention, practical skills, and engagement	Adapt teaching methods, introduce more interactive & real-world applications
Teaching Process	Optimize instructional methods for better knowledge transfer	Adjust course delivery (e.g., increase project-based learning, modify blended learning ratio)
Course Content & Materials	Ensure materials are current, relevant, and effective	Update study resources, enhance digital tools, add case studies & expert lectures

B) Actions for Continuous Improvement

1) Improving Student Learning

To enhance **student engagement and comprehension**, the following strategies will be implemented:

✅ **Integrating More Active Learning Methods**

- Increase **project-based, challenge-based, and problem-based learning**.
- Incorporate **more practical exercises using AI & VR simulations** for workplace safety training.
- Encourage **peer learning and collaboration in team-based assessments**.

✅ **Personalized Feedback & Self-Assessment**

- Provide **personalized feedback sessions** after major assessments.
- Use **self-assessment tools** for students to track their own progress.
- Implement **peer-review sessions** for group projects.

✅ **Real-World Application & Industry Exposure**

- Strengthen **industry partnerships** to provide **guest lectures, case studies, and hands-on projects**.
- Introduce **internship opportunities and mentorship programs** with OSH professionals.

2) Improving the Teaching Process

To enhance the **effectiveness of instructors and teaching formats**, adjustments will be made based on feedback:

✅ **Optimizing Asynchronous & Synchronous Learning Balance**

- Adjust the mix of **self-paced online learning (asynchronous)** vs. **live virtual/in-person classes (synchronous)**.
- Provide **more video-based materials** (short clips, animated explanations, real-world safety case studies).
- Incorporate **interactive discussion forums & Q&A sessions** in Moodle.

✅ **Enhancing Instructor-Learner Interactions**

- Increase **live office hours and interactive workshops**.
- Provide **mid-course student check-ins** to address challenges early.
- Organize **more personal or small-group feedback sessions** after key milestones.

✅ **More or Less Projectized Assignments**

- **For students who prefer hands-on learning**, offer **more project-based tasks** with real-world applications.
- **For students who prefer theoretical depth**, allow **alternative assignments focusing on research & policy analysis**.

3) Improving Course Content & Learning Materials

To ensure **up-to-date, engaging, and accessible content**, the following actions will be taken:

✅ **Enhancing Digital & Multimedia Learning Resources**

- Expand **interactive e-learning content** (VR training, AI-driven risk assessments).
- Develop **short explainer videos** on complex OSH concepts.
- Provide **industry case studies in video or simulation format**.

✅ **Specializing Content for Advanced Learners**

- Offer **optional deep-dive sections** on **specific Industry 4.0 safety risks**.
- Introduce **elective sub-modules** for students interested in **entrepreneurship, policymaking, or scientific research**.

✅ **Providing More Accessible Learning Materials**

- Create **a mix of digital and physical learning materials** (e-books, printed handbooks, downloadable safety manuals).
- Improve **accessibility options** (subtitles, transcripts, audio versions of lectures).

C) Evaluation & Continuous Improvement Cycle

The **evaluation cycle** follows a structured **Plan-Do-Check-Act (PDCA) Model** for continuous refinement:

1) **Plan** – Define evaluation goals, collect data from surveys, feedback sessions, and instructor reflections.
2) **Do** – Implement incremental improvements (adjust course format, content, or teaching methods).
3) **Check** – Analyze results from exams, student engagement, and learning outcomes.
4)**Act** – Modify **curriculum, teaching strategies, or resources** for future course iterations.

How Evaluation Data Will Be Used:

📊 **Immediate Adjustments (Within Semester)**

- Modify **lecture pacing, feedback frequency, and project workload** based on mid-course evaluations.
- Offer **supplementary sessions or additional materials** for difficult topics.

📊 **End-of-Course Adjustments (For Next Semester)**

- Update **teaching materials, assessment formats, and LMS resources**.
- Adjust **course structure based on student feedback and academic performance data**.

📊 **Long-Term Adjustments (Annual Review & Industry Validation)**

- Conduct **external benchmarking with OSH experts and academic committees**.
- Integrate **latest research, regulations, and technological advancements** into the curriculum.

4 Syllabus/Module Handbook

Entry for the Syllabus/Module Handbook (Example for “Managing Digital Change”)

<table>
<tr><td colspan="7">Managing Digital Change (MOD-E0x)</td></tr>
<tr><td colspan="2">Module Owner
Kanan Hasanov</td><td>Workload
180 h</td><td>Credits
6 ECTS</td><td>Semester
2</td><td>Frequency
spring semester</td><td>Duration
1 Semester</td></tr>
<tr><td>1</td><td colspan="2">Course Title
Safe Workplaces</td><td colspan="2">Contact hours
4 hours per week / 60 h in total</td><td>Self-Study
120 h</td><td>Planned Group Size
25 students</td></tr>
<tr><td>2</td><td colspan="6">Course Description

The increasing digitalization of workplaces introduces new challenges and risks in occupational safety and health (OSH). The module explores risk assessment methodologies, digital transformation in OSH management, and compliance strategies for Industry 4.0 environments.

Students will analyze the impact of AI, IoT, automation, and cybersecurity on workplace safety while learning practical risk management techniques and regulatory compliance strategies.

This module combines theoretical knowledge, hands-on training, and scientific research, equipping students with the skills to lead OSH initiatives in modern workplaces.</td></tr>
<tr><td>3</td><td colspan="6">Course Structure

1. Foundations of Occupational Safety & Health (OSH) in Digital Workplaces

1.1 OSH regulations & compliance frameworks (ISO 45001, EU-OSHA, ILO guidelines)
1.2 Traditional vs. digital workplace safety
1.3 Human factors & cognitive ergonomics in OSH
1.4 Risk management frameworks in Industry 4.0 environments
2. Digital Transformation & OSH Risk Management

2.1 Impact of AI, robotics, and IoT on workplace safety
2.2 Cybersecurity threats in OSH management
2.3 Digital safety monitoring & predictive analytics
2.4 Ethical concerns in employee tracking and AI-based monitoring
3. Workplace Ergonomics, Well-Being & Safety Culture

3.1 Psychosocial risks & stress management in digital workplaces
3.2 Ergonomic assessment in remote & hybrid work environments
3.3 OSH digital training tools (VR-based safety simulations, gamification)
3.4 Building a human-centered safety culture in organizations
4. OSH Leadership & Strategic Decision-Making

4.1 Strategic safety management & decision-making models</td></tr>
</table>

	4.2 Crisis management & emergency response in digital workplaces 4.3 Sustainability & ESG (Environmental, Social, Governance) in OSH 4.4 Compliance & governance in digitalized work environments
4	**Application Focus** Students will work on a real-world OSH case study, collaborating with industry partners to develop innovative safety solutions for digital workplaces. This may include: ✅ Analyzing OSH challenges in Industry 4.0 environments ✅ Developing AI-driven safety monitoring strategies ✅ Designing training simulations for ergonomic workplace safety Companies will be invited to contribute case studies, data, and project supervision, enabling hands-on industry experience.
5	**Scientific Focus** Students will engage in scientific research and policy development through: 📖 Literature review on OSH best practices 📊 Data-driven analysis of workplace risks 📝 Scientific paper writing & publication in OSH journals 🎤 Presentation of findings in academic & industry conferences

6	**Parameters**
	
	• ECTS: 6
	• Total Study Hours: 180
	• Weekly Contact Hours: 4
	• Contact Hours: 60
	• Self-Study: 120
	• Course Characteristics: Elective
	• Course Frequency: Annual (Summer Semester)
	• Max Enrollment: 25 students
	• Prerequisites: None
	• Competencies Developed: Theoretical, Practical, and Scientific Skills
	• Assessment:
	  • Team Project Presentation – 50% (OSH Innovation Challenge)
	  • Final Research Paper (25 pages) – 50% (OSH Policy Report, Industry Analysis)
	• Teaching Staff: Open Community of Practice, OSH Experts & Industry Professionals

7	**7.1 Knowledge** 📌 Explain key OSH regulations & compliance frameworks. 📌 Understand the impact of digital transformation on workplace safety. 📌 Compare risk assessment methodologies in traditional vs. digital workplaces. 📌 Analyze the role of AI, IoT, and cybersecurity in OSH.

	7.2 Skills 🛠 Conduct OSH risk assessments using AI & digital tools. 🛠 Apply safety monitoring techniques in hybrid & remote work settings. 🛠 Develop data-driven OSH strategies for industry use cases. 🛠 Use VR & gamification for workplace safety training. **7.3 Competence – Ability & Attitude** ✅ Collaborate in interdisciplinary teams to solve OSH challenges. ✅ Present findings to industry partners and discuss professional solutions. ✅ Lead OSH decision-making & compliance management in digital workplaces. ✅ Develop scientific publications & policy recommendations on workplace safety.
8	**Teaching and training methods** • 📄 **Virtual & in-person lectures** – Theoretical knowledge & regulatory updates. 📊 **Case-based learning** – Real-world OSH case studies from industry. 🛠 **Workshops & hands-on training** – Digital risk assessment tools, AI-based safety solutions. 🎤 **Presentations & scientific discussions** – OSH innovations in Industry 4.0. 📚 **Independent research & policy development** – Literature review, safety regulations, and academic writing.
9	**Curricula Integration** The module is designed for **integration into multiple MSc, PhD, and professional programs**, including: ✅ **Occupational Safety & Health (OSH)** – Core or elective module. ✅ **Engineering (Industrial, Mechanical, Digital)** – Safety specialization. ✅ **Business & HR Management** – Workplace well-being & compliance. ✅ **Computer Science & AI** – AI-driven safety solutions. This module can also be offered as a **standalone professional certification** for OSH practitioners.
10	**References** International OSH Standards: ISO 45001 – Occupational Health & Safety Management Systems EU-OSHA Reports & ILO Conventions Key Books & Research Publications: Workplace Safety in Industry 4.0: Challenges & Innovations Ergonomics & Cognitive Workload in Hybrid Environments AI & IoT in OSH Risk Management Scientific Papers & Case Studies: Peer-reviewed research on AI-driven workplace safety Case studies on VR-based safety training & ergonomic risk assessments EU: The European Qualifications Framework: Supporting Learning, Work, and Cross-Border Mobility, Luxembourg: Publications Office of the European Union, 2018. EU: Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), Brussels, Belgium, 2015. Available at: https://enqa.eu/index.php/home/esg/ Gruen, G.; Tritscher-Archan, S.; Weiß, S.: Guidelines for the Description of Learning Outcomes, ZOOM Partnership, 2009. Available at: www.zoom-eqf.eu

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5 References

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