BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

DELIVERABLE № 3.1

B-GREEN-ED MICRO-CREDENTIALS CURRICULA

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Elaborated by	**BFU, MRU, UPV, USVT**
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Deliverable target group	**University lecturers, students, all interested parties**
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Authors and Collaborators	
BULGARIA	
BURGAS FREE UNIVERSITY /BFU/ - COORDINATOR and Author	
BULGARSKI INSTITUT ZA STANDARTIZACIA /BDS/ - Collaborator	
ROMANIA	
ASOCIATIA DE STANDARDIZARE DIN ROMANIA /ASRO/ - Collaborator	
UNIVERSITATEA DE STIINTELE VIETII "REGELE MIHAIL I AL ROMANIA" DIN TIMISOARA /USVT/ - Author	
SPAIN	
UNIVERSITAT POLITECNICA DE VALENCIA /UPV/ - Author	
LITHUANIA	
MYKOLO ROMERIO UNIVERSITETAS /MRU/ - Author	

INTRODUCTION

This document consists of micro-credential courses' curricula developed within the framework of the B-Green-ED Project by all involved university partners, supported by the national standard bodies of Bulgaria and Romania.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

CIRCULAR ECONOMY, BUSINESS MODELS AND GREEN STANDARDS

SYLLABUS

BURGAS FREE UNIVERSITY

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Elaborated by	Burgas Free University **Faculty of Economics**
Work Package № and Title	WP3 - Development
Dissemination Level	International
Language	EN and Bulgarian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Circular Economy, business models and green standards		
Equivalent in ECTS	*3 ECTS*		
Approved by:	BFU Center for Distance Learning, Department for qualification and retraining		
Date of approval:	01.10.2023		
Duration in hours[1]	75		
Teaching board	Title	Name	e-mail
	Prof.	Diana Sabotinova	sabotinova@bfu.bg
	Assoc. Prof	Mariya Monova-Zheleva	mariaj@bfu.bg

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with basic concepts and terms such as circular economy, green business and business models, and green entrepreneurship. A key emphasis of the course is the presentation of the "eco-design" paradigm in the process of designing and developing business models for the circular economy and the mechanisms for determining material efficiency in the context of the standards CLC/TR 45550:2020, EN 45555:2019, EN ISO 14006: 2020 and EN 45554:2020.* *The specificity of this training course assumes that the course participants are students (bachelor's or master's degree), professionals and other external users with an economic profile.*
Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate

[1] To be considered as learning hours.

	☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an economic educational background.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of circular economy, green business and the different categories of business models; - To familiarize the students with the main paradigms and concepts related to the standardization process. - To acquaint students with the definitions related to material efficiency according to standard CLC/TR 45550:2020; - To acquaint learners with the general methods for assessing the possibility of recycling and recovery of energy-related products, according to the methodology set by the European standard EN 45555:2019; - To acquaint students with the basic guidelines for applying the principles of eco-design in the construction, documentation and maintenance of environmental management systems according to the EN ISO 14006:2020 standard; - To acquaint learners with the main parameters and methods for assessing the ability to repair, reuse and upgrade energy-related products according to the EN 45554:2020 standard.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.

Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers three mandatory and one optional additional module. The compulsory modules of the course are: Module 1: Circular economy, green business models and material efficiency - Circular economy, green business and green entrepreneurship - Green business models and their categorization - Standards and standardization – nature of standards, types of standards, standardization organizations, standardization process, standards and legislation. - Definitions related to material efficiency according to standard CLC/TR 45550:2020 Module 2: General methods for assessing the recyclability and recovery of energy-related products - Scope of standard EN 45555:2019; - Stages and phases of the process of assessing the possibility of recycling/recovery of energy-related products (ErP); - Optimizing product recycling (EoL); - Design criteria for design related to recycling and recovery; - Evaluation of the possibility of recycling and recovery of ErP; - Documenting the results of the ErP recyclability and recovery assessment. Module 3: Ecodesign of environmental management systems - basic guidelines - Scope of standard EN ISO 14006:2020; - Environmental management systems - basic terms and definitions related to: • organization and leadership, • planning and • job support, • performance evaluation and optimization. - Ecodesign – fundamental concepts.

	Module 4 (Additional): General methods for assessing the repairability, reusability and upgradeability of ErP - Scope of standard EN 45554:2020; - Basic terms and definitions; - Criteria for identifying the evaluation parts - product-related and maintenance-related. - Documenting the assessment results.

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 1		
Structural unit title	In-class activities duration:	10
Circular economy, green business models and material efficiency	Out-of-class activities duration:	12
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 2		
Structural unit title	In-class activities duration:	10
General methods for assessing the recyclability and recovery of energy-related products	Out-of-class activities duration:	12
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	

Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 3		
Structural unit title	In-class activities duration:	10
Eco-design of environmental management systems - basic guidelines	Out-of-class activities duration:	12
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	**10**
Elective Module 4		
Structural unit title	In-class activities duration:	5
General methods for assessing the repairability, reusability and upgradeability of ErP	Out-of-class activities duration:	4
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	

Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic. - EN 4555X: series of standards: o EN 45552:2020 General method for the assessment of the durability of energy-related products; o EN 45553:2020 General method for the assessment of the ability to remanufacture energy-related products; o EN 45554:2020 General methods for the assessment of the ability to repair, reuse and upgrade energy-related products; o EN 45555:2019 General methods for assessing the recyclability and recoverability of energy-related products; o EN 45556:2019 General method for assessing the proportion of reused components in energy-related products; o EN 45557:2020 General method for assessing the proportion of recycled material content in energy-related products; o EN 45558:2019 General method to declare the use of critical raw materials in energy-related products; o EN 45559:2019 Methods for providing information relating to material efficiency aspects of energy-related products. - German Cooperation and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2015): Green Business Model Navigator - Green-4-Future (2022) Business Modeling for Circular Economy Businesses, https://elearning.green4future.eu/ - Markides, C.C. (2015): Research on Business Models: Challenges and Opportunities. Business Models and Modelling; Volume 33; Advances in Strategic Management, editors C. Baden-Fuller and V. Mangematin. Emerald Press

	- N.M.P.Bocken, (2015): Sustainable venture capital – Catalyst for sustainable start-up success? Journal of Cleaner Production 109, part A., pp. 647-658 - Organization for Economic Co-operation and Development (OECD) (2013): Green Growth Papers - Why New Business Models Matter for Green Growth. - Webinar of 2020-12-01 "European standards addressing material efficiency aspects" https://www.cencenelec.eu/media/CEN-CENELEC/AreasOfWork/CEN-CENELEC_Topics/Ecodesign,%20energy%20labelling%20and%20material%20efficiency/Quicklinks%20General/Documentation%20and%20Materials/qa_2020-12-01_webinar_material_efficiency.pdf

Course modules description

MODULE 1. Circular economy, green business models and material efficiency

Module Abstract

The module introduces fundamental concepts, principles, and definitions related to circular economy. The conceptual framework of green entrepreneurship is described with a focus on the firm's life cycle in green entrepreneurship. Some specific dimensions of knowledge about Green Business Models (GBMs) are discussed in respect of conceptual definitions. A classification of green business models is presented. In the module are outlined some important characteristics of CLC/TR 45550:2020 "Definitions related to material efficiency" as well.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *To know and understand concepts, principles, and definitions related to circular economy and to understand*
- *To know GBM and their classification*
- *To know parameters and methods relevant for assessing durability, upgradability and ability to repair, re-use and re-manufacture of products according to CLC/TR 45550:2020*

Criteria for successful completion of the module

Successful completion of post-module quiz.

MODULE 2. General methods for assessing the recyclability and recovery of energy-related products

Module Abstract

The module offers an overview of the European Standard - EN 45555:2019 General methods for assessing the recyclability and recoverability of energy-related products. The module discusses how the recyclability, as well as the recoverability, assessment of a product should be documented. The need to report topic-related content to the different target audiences is assessed, and the data classified within the different sensitivity levels 1, 2, and 3 (according to EN 45559:2019, 5.1 and 5.2).

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *To know and understand methods for assessing the recyclability and recoverability of energy-related products.*
- *To know how to report recyclability, the recoverability as well as assessment of a product to the different target audiences.*

Criteria for successful completion of the module
Successful completion of post-module quiz.

MODULE 3. Eco-design of environmental management systems - basic guidelines

Module Abstract

The module offers an overview of the ISO 14006, Environmental management systems - Guidelines for incorporating eco-design, is an international standard that specifies guidelines to help organizations establish, document, implement, maintain, and continuously improve their eco-design management as part of the environmental management system. The terms related to organization and leadership management system, planning, performance evaluation and improvement are explained and discussed. The main concepts and paradigms related to the eco-design process are presented as well.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *To know and understand terms related to organization and leadership management system, planning, performance evaluation and improvement according to ISO 14006:2020.*
- *To know and understand the process of eco-design as an integration of environmental aspects into the product development process, by balancing ecological and economic requirements.*

Criteria for successful completion of the module
Successful completion of post-module quiz.

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Reference Number: 2022-1-BG01-KA220-HED-000085821

ELECTRONICS AND COMMUNICATION OF RENEWABLE ENERGY SOURCES - GREEN STANDARDS

SYLLABUS

BURGAS FREE UNIVERSITY

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Elaborated by	Burgas Free University **Faculty of Computer Science and Engineering**
Work Package № and Title	WP3 - Development
Dissemination Level	International
Language	EN and Bulgarian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Electronics and Communication of Renewable Energy Sources - Green standards
Equivalent in ECTS	*3 ECTS*
Approved by:	BFU Center for Distance Learning, Department for qualification and retraining
Date of approval:	01.10.2023
Duration in hours[1]	75
Teaching board	Title / Name / e-mail Assoc. Prof. / Plamen Angelov / pangelov@bfu.bg Assoc. Prof. / Yanislav Zhelev / jelev@bfu.bg Assoc. Prof. / Mariya Monova-Zheleva / mariaj@bfu.bg

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the main concepts and terms related to the circular economy and green business, the international terminology for energy efficiency and renewable energy sources (RES) and grid integration of renewable energy production introduced by EN ISO/IEC 13273-2:2015, EN ISO 50001:2018 and EN IEC 62934:2021 standards.* *The specificity of this study course assumes that the participants are students (bachelor's or master's degree), professionals and external users with a technical profile and knowledge in areas such as Communications and electronification for renewable energy sources, Computer systems and technologies, Power supply and electrical equipment, Electronification and communication of renewable energy sources.*

[1] To be considered as learning hours.

Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an educational background in the engineering domain.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of green business, circular economy and the different categories of circular economy business models; - To familiarize the students with the main paradigms and concepts related to the standardization process. - To acquaint the students with the general international terminology regarding energy efficiency and renewable energy sources according to standard EN ISO/IEC 13273-2:2015; - To provide students with theoretical and practical knowledge of energy management systems, the requirements for these systems, as well as the principles and requirements for their operation according to the EN ISO 50001:2018 standard; - To familiarize the students with the fundamental paradigms, principles and concepts related to network integration of renewable energy production according to the standard EN IEC 62934:2021.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.

Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers three mandatory modules as follows: Module 1: Circular economy, standardization and standards, energy efficiency and renewable energy sources (RES) - Circular economy and green business; - Standards – nature of standards and types of standards - Standardization organizations, standardization process, standards and legislation. - Common international terminology for energy efficiency and RES according to standard EN ISO/IEC 13273-2:2015 Module 2: Energy management systems - requirements, principles and rules of operation - Scope of EN ISO 50001:2018 standard; - the requirements for the creation and implementation of an energy management system according to the EN ISO 50001:2018 standard; - the requirements for maintaining and improving an energy management system according to the EN ISO 50001:2018 standard. Module 3: Grid integration of renewable energy production - Scope of standard EN IEC 62934:2021; - Basic terms and definitions in the field of grid integration of renewable energy generation according to standard EN IEC 62934:2021; - Technical problems of grid integration caused by renewable energy generation with variable sources and/or converter-based technology.

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 1		
Structural unit title	In-class activities duration:	10
Circular Economy, Standardization and Standards, Energy	Out-of-class activities duration:	15

Efficiency and Renewable Energy Sources (RES)		
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 2		
Structural unit title	In-class activities duration:	10
Energy Management Systems - Requirements, Principles and Rules of Operation	Out-of-class activities duration:	15
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	**25**
Mandatory Module 3		
Structural unit title	In-class activities duration:	10

Grid Integration of Renewable Energy Production	Out-of-class activities duration:	15
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic. - IEC, “An abundance of marine energy: soon to become a reality” - https://www.iec.ch/blog/abundance-marine-energy-soon-become-reality - IEC, “Wind energy investment slumps in Europe” - https://www.iec.ch/blog/wind-energy-investment-slumps-europe - IEC, “New standard for geothermal energy” - https://www.iec.ch/blog/new-standard-geothermal-energy-1 - ISO, “On the road to net zero” - https://www.iso.org/news/ref2682.html - ISO, “The power of the sun” - https://www.iso.org/news/ref2738.html - ISO 50001 - Energy management systems , LINK - German Cooperation and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2015): Green Business Model Navigator

	- Green-4-Future (2022) Business Modelling for Circular Economy Businesses, https://elearning.green4future.eu/ - Markides, C.C. (2015): Research on Business Models: Challenges and Opportunities. Business Models and Modelling; Volume 33; Advances in Strategic Management, editors C. Baden-Fuller and V. Mangematin. Emerald Press - N.M.P.Bocken, (2015): Sustainable venture capital – catalyst for sustainable start-up success? Journal of Cleaner Production 109, part A., pp. 647-658 - Organization for Economic Co-operation and Development (OECD) (2013): Green Growth Papers - Why New Business Models Matter for Green Growth.

Course modules description

MODULE TITLE: **Circular economy, standardization and standards, energy efficiency and renewable energy sources (RES)**

Module Abstract

This module presents some fundamental concepts and terms related to circular economy and green business. General information about the nature of the standards, the standardization types, the process of standardization and standardization organizations is provided. The last lecture from this module introduces the terminology related to energy efficiency and renewable energy sources (RES) according to standard EN ISO/IEC 13273-2:2015

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- You will know what circular economy and green business mean and what are the main types of business models.
- You will know what the nature of the standards is and what are the main types of standards
- You will have an awareness of the standardization organizations and the standardization process.
- You will have an awareness of the international terminology for energy efficiency and RES according to standard EN ISO/IEC 13273-2:2015.

Criteria for successful completion of the module

The module will be successfully completed if the test result is 60% as a minimum.

MODULE 2: **Electrical Energy Storage Systems – Requirements, Principles, and Rules of Operation**

Module Abstract

Reducing energy consumption and improving energy efficiency are top issues of the agenda on climate change. The module introduces terms and definitions used in the standard EN ISO 50001:2018. The learners are familiarized with the main strategic issues related to energy efficiency and energy management systems; the parameters of the analysis of the type of energy consumed and the key aspects related to the continuous improvement of final energy performance. The fundamental principles and requirements set by the standard regarding the performance evaluation for energy management system and their improvement are also discussed.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Knowledge and understanding of the requirements of EN ISO 50001:2018 regarding the establishing and maintaining an energy management system (EnMS).
- Know, understand, and can explain the main strategic issues related to energy efficiency and energy management systems; the parameters of the analysis of the type of energy consumed and the key aspects related to the continuous improvement of final energy performance.
- Know and understand the principles and approaches of monitoring, measurement, analysis and evaluation of the performance and effectiveness of management systems that are crucial for the internal auditing and quality assurance.

Criteria for successful completion of the module

The module will be successfully completed if the test result is 60% as a minimum.

Module Assessment

At the end of the module is included electronic test which will be evaluated. The score from the testing at the end of the module will be considered when the final course score is calculated. The test should be completed by a fixed time. Two attempts for the test are allowed and the highest score from these attempts is recorded as a result of the module.

MODULE 3: **Grid Integration of Renewable Energy Generation**

Module Abstract

The module introduces common concepts, terminology, and definition used in the standard IEC 62934:2021. The technical requirements for the power grid are introduced in terms of technical parameters and their nominal values and their permissible limits of variation. The important parameters of the processes of modelling, analysis and planning as well as control and protection are also discussed. The learners are familiarized with the terms and definitions related to the grid compliance testing, assessment, scheduling, and dispatching. The module also represents some schematic solutions for coupling alternative sources of electricity.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Knowledge and understanding of the concepts, terminology, and definition used in the standard IEC 62934:2021.
- Know the power grid related technical parameters and their nominal values and their permissible limits of variation.

- Know, understand, and can explain the principles of the processes of modelling, analysis and planning as well as control and protection related to power grid and integration of renewable energy sources.

Criteria for successful completion of the module
The module will be successfully completed if the test result is 60% as a minimum.

Module Assessment
At the end of the module is included electronic test which will be evaluated. The score from the testing at the end of the module will be considered when the final course score is calculated. The test should be completed by a fixed time. Two attempts for the test are allowed and the highest score from these attempts is recorded as a result of the module.

BOOSTING THE GREEN FUTURE
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Reference Number: 2022-1-BG01-KA220-HED-000085821

ENGINEERING AND EXPLOITATION OF ENERGY SYSTEMS - GREEN STANDARDS

SYLLABUS

BURGAS FREE UNIVERSITY

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Elaborated by	Burgas Free University **Faculty of Computer Science and Engineering**
Work Package № and Title	WP3 - Development
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Language	EN and Bulgarian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Electronics and Communication of Renewable Energy Sources - Green standards
Equivalent in ECTS	*3 ECTS*
Approved by:	BFU Center for Distance Learning, Department for qualification and retraining
Date of approval:	01.10.2023
Duration in hours[1]	75
Teaching board	Title / Name / e-mail Assoc. Prof. / Kamen Seymenliyski / kdimitrov@bfu.bg Assoc. Prof. / Yanislav Zhelev / jelev@bfu.bg Eng. / Radoslav Simeonov / radoslav.simionov@gmail.com Eng. / Eldar Zaerov / eldar.zaerov@gmail.com

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the basic concepts and concepts related to the circular economy and green business, energy management and storage systems, with the general international requirements for building energy management systems and the rules for their operation, as well as with the international terminology for energy efficiency and renewable energy sources (RES), introduced by the standards EN ISO/IEC 13273—2:2015, EN ISO 50001:2018, and EN IEC 62933-1:2018.* *The specificity of this training course assumes that the participants are students (bachelor's or master's), professionals and external users with a technical profile and knowledge in areas such as Communications and electronification for renewable energy sources, Power supply and*

[1] To be considered as learning hours.

	electrical equipment, Operation of energy systems, Security of strategic infrastructures and productions.
Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an educational background in the engineering domain.*
Learning Objectives	The main objectives of the course are: - -To familiarize the students with the concepts of green business, circular economy and the different categories of circular economy business models; - To familiarize the students with the main paradigms and concepts related to the standardization process. - To provide students with theoretical and practical knowledge of energy management systems, the requirements for these systems, as well as the principles and requirements for their operation according to the EN ISO 50001:2018 standard; - To acquaint students with the fundamental paradigms and concepts related to electrical energy storage systems according to standard EN IEC 62933-1:2018; - To acquaint the students with the international terminology regarding energy efficiency and renewable energy sources (RES) according to standard EN ISO/IEC 13273-2:2015.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.

Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers three mandatory modules as follows: Module 1: Circular Economy, Standardization and Standards, Common International Terminology for Energy Efficiency - Circular economy and green business; - Green business models and their categorization; - Standards – nature of standards and types of standards - Standardization organizations, standardization process, standards and legislation. - Common international terminology for energy efficiency according to standard EN ISO/IEC 13273-2:2015. Module 2: Energy management systems - requirements - Scope of EN ISO 50001:2018 standard; - Classification and specification of electrical energy storage systems - Principles for planning and installation of electrical energy storage systems according to standard EN ISO 50001:2018; - The requirements for maintenance and safety of electrical energy storage systems according to standard EN ISO 50001:2018. Module 3: Electrical Energy Storage Systems – Classification, Requirements, Principles and Safety - Scope of standard EN IEC 62933-1:2018; - Terms applicable to electrical energy storage systems (EES) according to standard EN IEC 62933-1:2018; - Terms necessary for the definition of electrical energy storage system parameters, test methods, planning, installation, safety and environmental issues according to standard EN IEC 62933-1:2018.

Structural unit type	Total duration in hours:	25
Mandatory Module 1		
Structural unit title	In-class activities duration:	10
Circular Economy, Standardization and Standards, Common International Terminology for Energy Efficiency	Out-of-class activities duration:	15
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	25
Mandatory Module 2		
Structural unit title	In-class activities duration:	10
MODULE 2. Energy management systems - requirements	Out-of-class activities duration:	15
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	25
Mandatory Module 3		
Structural unit title	In-class activities duration:	10

Electrical Energy Storage Systems - Classification, Requirements, Principles and Safety	Out-of-class activities duration:	15
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic. - IEC, “An abundance of marine energy: soon to become a reality” - https://www.iec.ch/blog/abundance-marine-energy-soon-become-reality - IEC, “Wind energy investment slumps in Europe” - https://www.iec.ch/blog/wind-energy-investment-slumps-europe - IEC, “New standard for geothermal energy” - https://www.iec.ch/blog/new-standard-geothermal-energy-1 - ISO, “On the road to net zero” - https://www.iso.org/news/ref2682.html - ISO, “The power of the sun” - https://www.iso.org/news/ref2738.html - ISO 50001 - Energy management systems , LINK - German Cooperation and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2015): Green Business Model Navigator - Green-4-Future (2022) Business Modelling for Circular Economy Businesses, https://elearning.green4future.eu/

	- Markides, C.C. (2015): Research on Business Models: Challenges and Opportunities. Business Models and Modelling; Volume 33; Advances in Strategic Management, editors C. Baden-Fuller and V. Mangematin. Emerald Press - N.M.P.Bocken, (2015): Sustainable venture capital – catalyst for sustainable start-up success? Journal of Cleaner Production 109, part A., pp. 647-658 - Organization for Economic Co-operation and Development (OECD) (2013): Green Growth Papers - Why New Business Models Matter for Green Growth.

Course modules description

MODULE 1: **Circular Economy, Standardization and Standards, Common International Terminology for Energy Efficiency**

Module Abstract

This module presents some fundamental concepts and terms related to circular economy and green business. General information about the nature of the standards, the standardization types, the process of standardization and standardization organizations is provided. The last lecture from this module introduces the terminology related to energy efficiency and renewable energy sources (RES) according to standard EN ISO/IEC 13273-2:2015

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Know and understand what the circular economy and green business mean and what are the main types of business models.
- Know, understand, and can explain what the nature of the standards is and what are the main types of standards.
- Know about the standardization organizations and the standardization process.
- Know the concepts, international terminology and definitions about the energy efficiency and renewable energy sources according to standard EN ISO/IEC 13273-2:2015.

Criteria for successful completion of the module

The module will be successfully completed if the test result is 60% as a minimum.

Module Assessment

At the end of the module is included an electronic test which will be evaluated. The score from the testing at the end of the module will be considered when the final course score is calculated. The test should be completed by a fixed time. Two attempts for the test are allowed and the highest score from these attempts is recorded as a result of the module.

MODULE 2: **Energy management systems - requirements**

Module Abstract

The module provides an in-depth understanding of the EN ISO 50001:2018 standard, a pivotal tool for organizations aiming for efficient energy management. By grasping its foundational principles and implementation methods, attendees can harness strategies for continual energy performance improvement, tailored to an organization's unique context. The module contributes to the improvement of the skills to discern the potential impacts of strategic decisions on energy performance and efficient

resource utilization. The principles of strategic planning, which not only ensure that the energy management system *(EnMS) is congruent with extant organizational requirements but also equips it with the agility to navigate prospective challenges are discussed.*

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Knowledge and understanding of the concepts, international terminology and definitions of *EN ISO 50001:2018* regarding the energy management systems (EnMS).
- Know and understand the tools for context analysis and can explain differences among them.
- Know the Energy performance indicators (EnPIs)
- Know, understand and can explain the main principles for EnMS operation, performance evaluation, and improvement.

Criteria for successful completion of the module

The module will be successfully completed if the test result is 60% as a minimum.

Module Assessment

At the end of the module is included an electronic test which will be evaluated. The score from the testing at the end of the module will be considered when the final course score is calculated. The test should be completed by a fixed time. Two attempts for the test are allowed and the highest score from these attempts is recorded as a result of the module.

MODULE 3: **Electrical energy storage systems - classification, requirements, principles, and safety**

Module Abstract

The module introduces common concepts, definitions, and terms applicable to electrical energy storage (EES) systems including terms necessary for the definition of unit parameters, test methods, planning, installation, safety, and environmental issues specified by the standard IEC 62933-1:2018. The topics discussed in this module help trainees improve their awareness regarding harnessing the full potential of EES systems that play a pivotal role in addressing the challenges posed by intermittent renewable energy sources, such as solar and wind, by storing excess energy when it's available and releasing it when demand is high.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Knowledge and understanding of the concepts, terminology, and definition used in the standard IEC 62933-1:2018.
- Know the EES systems classification and specifications.

- Know, understand, and can explain the principles of the EES systems planning, installation, and operation.
- Know, understand, and can explain the terms related to EES systems safety and environmental issues.

Criteria for successful completion of the module

The module will be successfully completed if the test result is 60% as a minimum.

Module Assessment

At the end of the module is included an electronic test which will be evaluated. The score from the testing at the end of the module will be considered when the final course score is calculated. The test should be completed by a fixed time. Two attempts for the test are allowed and the highest score from these attempts is recorded as a result of the module.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

QUALITY MANAGEMENT SYSTEMS STANDARDS

SYLLABUS

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

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Elaborated by	Universitat Politècnica de València **Research institute of Water Engineering and Environment**
Work Package Nº and Title	WP3 - Development
Dissemination Level	International
Language	EN and Spanish

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Quality Management Systems Standards
Equivalent in ECTS	*1 ECTS*
Approved by:	UPV Research institute of Water Engineering and Environment
Date of approval:	01.10.2023
Duration in hours[1]	25
Teaching board	

Title	Name	e-mail
Assoc. Prof.	Javier Rodrigo-Ilarri	jrodrigo@upv.es
Assist. Prof.	Mª Elena Rodrigo-Clavero	marodcla@upv.es

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the content of the quality management systems standards, their fundamentals and vocabulary, requirements, and ways to achieve sustained success on the quality management of an organization. The course includes the analysis of the content of the following standards: ISO 9000:2015, ISO 9001:2015, ISO 9004:2018, ISO 10006, ISO 10007 and ISO 18091. The specificity of this study course assumes that the participants are students (bachelor's or master's degree), professionals and external users with a technical profile and knowledge in areas such as Science, Engineering or Business Studies.*
Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development

[1] To be considered as learning hours.

Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*No pre-requisites are required.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of quality management systems - To familiarize the students with the main paradigms and concepts related to the standardization process. - To acquaint the students with the general international terminology regarding quality management systems according to standard ISO 9000:2015; - To provide students with theoretical and practical knowledge of quality management standards required by ISO 9001:2015 standard; - To provide students with the fundamental information about quality of organizations as stated on ISO 9004:2018 - To familiarize the students with the fundamental paradigms, principles and concepts related to project management (ISO 10006:2018) and configuration management (ISO 1007:2018) - To introduce the content of the ISO 18091:2019 standard about Guidelines for the application of ISO 9001 in local government.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered.

	The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers three mandatory modules as follows: Module 1.- Fundamentals of quality management systems ☐ 1.1.- Quality management systems. Fundamentals and vocabulary (ISO 9000:2015) ☐ 1.2.- Quality management systems. Requirements. (ISO 9001:2015) ☐ 1. 3.- Quality management of an organization (ISO 9004:2018) Module 2.- Quality management in projects ☐ 2.1. Guidelines for quality management in projects (ISO 10006:2017) ☐ 2.2. Quality management. Guidelines for configuration management (ISO 10007:2017) Module 3.- Application of ISO 9001 in local government (ISO 18091:2019)

Structural unit type	**Total duration in hours:**	**15**
Mandatory Module 1		
Structural unit title	In-class activities duration:	6
Fundamentals of quality management systems	Out-of-class activities duration:	9
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	6
Mandatory Module 2		
Structural unit title	In-class activities duration:	2
Quality management in projects	Out-of-class activities duration:	4
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	4
Mandatory Module 3		
Structural unit title	In-class activities duration:	2
Application of ISO 9001 in local government	Out-of-class activities duration:	2
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module.

	The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic. - IEC, "An abundance of marine energy: soon to become a reality" - https://www.iec.ch/blog/abundance-marine-energy-soon-become-reality - IEC, "Wind energy investment slumps in Europe" - https://www.iec.ch/blog/wind-energy-investment-slumps-europe - IEC, "New standard for geothermal energy" - https://www.iec.ch/blog/new-standard-geothermal-energy-1 - ISO, "On the road to net zero" - https://www.iso.org/news/ref2682.html - ISO, "The power of the sun" - https://www.iso.org/news/ref2738.html - ISO 50001 - Energy management systems , LINK - German Cooperation and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2015): Green Business Model Navigator - Green-4-Future (2022) Business Modelling for Circular Economy Businesses, https://elearning.green4future.eu/ - Markides, C.C. (2015): Research on Business Models: Challenges and Opportunities. Business Models and Modelling; Volume 33; Advances in Strategic Management, editors C. Baden-Fuller and V. Mangematin. Emerald Press - N.M.P.Bocken, (2015): Sustainable venture capital – catalyst for sustainable start-up success? Journal of Cleaner Production 109, part A., pp. 647-658 - Organization for Economic Co-operation and Development (OECD) (2013): Green Growth Papers - Why New Business Models Matter for Green Growth.

MODULE 1.- Fundamentals of quality management systems

Module Abstract

Studying the fundamentals of quality management systems (QMS) holds immense importance, particularly in fields like environmental engineering:

- Ensuring Compliance: QMS modules provide insights into standards like ISO 9001, which are crucial for compliance with industry regulations and quality benchmarks. In environmental engineering, adherence to specific standards is vital.
- Enhancing Efficiency: Understanding QMS fundamentals helps in streamlining processes, reducing errors, and optimizing resource utilization. This is pivotal in environmental engineering projects aiming for minimal waste and maximum efficiency.
- Improving Performance: QMS emphasizes continuous improvement. Knowledge of these fundamentals equips professionals to identify areas for enhancement, thereby improving overall performance and outcomes in environmental projects.
- Risk Management: QMS modules often delve into risk assessment and mitigation strategies. In environmental engineering, where risks to ecosystems and communities are significant, this knowledge aids in identifying, assessing, and managing potential environmental hazards.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Understanding QMS Principles: Students should grasp the foundational principles of QMS, including principles of quality, customer focus, leadership, process approach, and continual improvement. In an environmental context, this understanding would align with eco-centric quality principles.
- Knowledge of Relevant Standards: Learning outcomes often involve familiarity with key quality standards like ISO 9001 (quality management) and ISO 14001 (environmental management). Understanding these standards aids in implementing effective quality and environmental management systems.
- Application in Environmental Context: Students should be able to apply QMS principles within the realm of environmental engineering. This includes understanding how to integrate quality management practices with environmental considerations, compliance, and sustainability.
- Risk Assessment and Mitigation: Mastery of risk assessment methodologies within the context of QMS is essential. This involves identifying potential risks in environmental engineering projects and implementing strategies to mitigate these risks.
- Process Improvement Skills: Learning outcomes may involve acquiring skills to identify inefficiencies and areas for improvement within environmental engineering processes. Students should be capable of suggesting and implementing enhancements to optimize outcomes.
- Compliance and Regulatory Understanding: Students should demonstrate knowledge of relevant regulations, laws, and compliance requirements within the environmental engineering domain. Understanding how QMS aligns with and supports compliance is crucial.

MODULE 2.- Quality management in projects

Module Abstract

The "Quality Management in Projects" module is designed to provide comprehensive insights into the principles, methodologies, and practices essential for ensuring and maintaining high standards of quality in project management. The module focuses on the application of quality management principles within the project context, emphasizing their significance in achieving project success, stakeholder satisfaction, and overall organizational goals.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Understanding Quality in Project Management: This module introduces students to the concept of quality within project management, emphasizing its multidimensional nature and its integration across project lifecycles.
- Quality Standards and Frameworks: Students will delve into various quality standards, frameworks, and methodologies applicable to project management.
- Quality Planning and Assurance: The module covers the process of developing quality management plans, setting quality objectives, and implementing assurance measures to ensure adherence to established standards throughout project execution.
- Quality Control and Monitoring: Students will learn techniques and tools for quality control and monitoring within projects. Emphasis is placed on real-time assessment, corrective actions, and ensuring compliance with defined quality benchmarks.
- Risk and Quality Management Integration: The module explores the intersection between risk management and quality management in projects. Students will understand how risk assessment and mitigation strategies influence and are influenced by quality initiatives.

MODULE 3.- Application of ISO 9001 in local government

Module Abstract

The "Application of ISO 9001 in Local Government" module is specifically tailored to equip professionals working within local government entities with the knowledge and skills necessary to implement and effectively utilize ISO 9001 quality management principles and practices.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- A comprehensive understanding of ISO 9001 standards and their application in local government contexts.
- Competence in developing, implementing, and maintaining quality management systems tailored to local government operations.
- Skills to conduct internal audits, evaluate compliance, and drive continual improvement within local government entities.
- The ability to identify areas for process enhancement, leading to increased efficiency and improved service delivery.
- Strategies for fostering stakeholder engagement and ensuring a customer-centric approach in local government services.

TEACHING BOARD

- Prof. Dr. Javier Rodrigo-Ilarri, Associate Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)
- Prof. Dr. María-Elena Rodrigo-Clavero, Assistant Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)

CRITERIA FOR SUCCESSFUL COMPLETION OF THE COURSE MODULES

In-class learning activities:

- Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions.
- Students participate in communication activities - individual contact with the teacher, and forum discussions.
- Students participate in activities to verify and evaluate the knowledge acquired within the course module.

Out-of-class assignments:

- Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor.
- Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher.
- Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

- reinforcing learning by highlighting areas of improvement and reinforcing correct concepts.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

ENVIRONMENTAL MANAGEMENT SYSTEMS STANDARDS

SYLLABUS

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

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Elaborated by	Universitat Politècnica de València **Research institute of Water Engineering and Environment**
Work Package Nº and Title	WP3 - Development
Dissemination Level	International
Language	EN and Spanish

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Environmental Management Systems standards		
Equivalent in ECTS	*1 ECTS*		
Approved by:	UPV Research institute of Water Engineering and Environment		
Date of approval:	01.10.2023		
Duration in hours[1]	25		
Teaching board	Title	Name	e-mail
	Assoc. Prof.	Javier Rodrigo-Ilarri	jrodrigo@upv.es
	Assist. Prof.	Mª Elena Rodrigo-Clavero	marodcla@upv.es

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the content of the environmental management systems standards, their fundamentals and general guidelines on their implementation and performance evaluation. The guidelines for incorporating eco-design and life cycle assessment are also introduced. The course includes the analysis of the content of the following standards: ISO 14001:2015, 14004:2016, 14006:2020, 14031:2021, 14040:2006 and 14044:2006. The specificity of this study course assumes that the participants are students (bachelor's or master's degree), professionals and external users with a technical profile and knowledge in areas such as Science, Engineering or Business Studies.*
Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning

[1] To be considered as learning hours.

	☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*No pre-requisites are required.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of environmental management systems - To familiarize the students with the main paradigms and concepts related to the standardization process - To acquaint the students with the requirements with guidance for use of environmental management systems according to standard ISO 14001:2015 - To provide students environmental performance evaluation methodologies, according to ISO 14031:2013 standard - To provide students with the fundamental information about life cycle assessment, as stated on ISO 14040:2016 and 14044:2006
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and

	evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers two mandatory modules as follows: Module 1.- Fundamentals of environmental management systems ☐ 1.1.- Requirements with guidance for use (ISO 14001:2015) ☐ 1.2.- General guidelines on implementation (ISO 14004:2016) ☐ 1. 3.- Guidelines for incorporating eco-design (ISO 14006:2020) Module 2.- Performance evaluation and life cycle assessment ☐ 2.1. Environmental performance evaluation. Guidelines (ISO 14031:2021) ☐ 202. Life cycle assessment (ISO 14040:2006 and ISO 14044:2006)

Structural unit type Mandatory Module 1	**Total duration in hours:**	**15**
Structural unit title	In-class activities duration:	6
Fundamentals of environmental management systems	Out-of-class activities duration:	9
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type Mandatory Module 2	**Total duration in hours:**	**10**
Structural unit title	In-class activities duration:	4
Performance evaluation and life cycle assessment	Out-of-class activities duration:	6

In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources: - Clements, R.B. (1996-01-01). Complete Guide to ISO 14000. Prentice Hall. pp. 316. ISBN 9780132429757. - Brorson, T. (1999). Environmental Management: How to Implement an Environmental Management System Within a Company Or Other Organization. EMS AB. p. 300. ISBN 9789163076619. - National Research Council (1999). Environmental Management Systems and ISO 14001 Federal Facilities Council Report No. 138. National Academies Press. doi:10.17226/6481. ISBN 9780309184342. - Sheldon, C. (1997). ISO 14001 and Beyond: Environmental Management Systems in the Real World. Greenleaf Publishing. p. 410. ISBN 9781874719014

MODULE 1.- Fundamentals of environmental management systems

Module Abstract

The "Fundamentals of Environmental Management Systems (EMS)" module serves as a foundational exploration into the principles, concepts, and frameworks essential for understanding and implementing effective environmental management practices within various organizational settings. This module aims to equip participants with a comprehensive understanding of EMS, emphasizing the significance of sustainable environmental stewardship in contemporary industries.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- **Comprehensive Understanding:** Participants will acquire a deep comprehension of the fundamental concepts, principles, and objectives of Environmental Management Systems (EMS), including its relevance in contemporary industries.
- **Knowledge of Standards and Regulations:** Gain familiarity with global environmental standards and regulations, with a primary focus on key standards like ISO 14001. Participants will understand the structure, requirements, and applicability of these standards within organizational contexts.
- **Application of EMS Elements:** Develop the ability to apply the core elements of EMS, including policy development, planning, implementation, monitoring, and corrective action, to foster sustainable practices within organizations.
- **Environmental Impact Assessment:** Acquire skills in conducting environmental impact assessments and risk analyses. Participants will be capable of identifying, evaluating, and mitigating environmental risks in organizational operations.
- **Continuous Improvement:** Understand strategies for promoting a culture of continual improvement within EMS frameworks. Participants will learn methods for setting objectives, evaluating performance, and implementing corrective measures to enhance environmental outcomes.
- **Stakeholder Engagement:** Develop effective communication and stakeholder engagement strategies within EMS implementation. Participants will learn to engage diverse stakeholders, communicate environmental objectives, and foster cooperation and alignment.
- **Integration with Organizational Processes:** Gain the ability to seamlessly integrate EMS principles into existing organizational processes, fostering a holistic approach to environmental management across departments and functions.
- **Critical Analysis and Problem-Solving:** Develop critical thinking skills to analyze environmental challenges and identify opportunities for improvement. Participants will be equipped to devise effective solutions aligned with EMS principles.
- **Ethical and Social Responsibility:** Understand the ethical implications of environmental management decisions and the social responsibility associated with implementing sustainable environmental practices within organizations.

MODULE 2.- Performance evaluation and life cycle assessment

Module Abstract

The module on Performance Evaluation and Life Cycle Assessment (LCA) offers a comprehensive exploration of methodologies, tools, and techniques essential for evaluating the performance and environmental impact of products, processes, and systems throughout their life cycles. This module aims to equip participants with the skills necessary to conduct robust assessments, make informed decisions, and drive sustainable practices within diverse industries.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Comprehensive Understanding: Participants will gain a comprehensive understanding of performance evaluation methodologies and the principles, methodologies, and applications of Life Cycle Assessment (LCA) across various industries.
- LCA Methodologies and Tools: Acquire proficiency in using LCA methodologies, frameworks, and specialized software tools for data collection, analysis, and interpretation, enabling effective assessment of environmental impacts.
- Environmental Impact Assessment: Develop skills to conduct thorough environmental impact assessments throughout the life cycle of products, processes, or systems, evaluating resource consumption, emissions, and ecological footprints.
- Metrics and Indicators: Familiarization with diverse environmental metrics and indicators used in performance evaluation and LCA, enabling participants to select and apply appropriate indicators to assess environmental impacts comprehensively.
- Application in Decision-Making: Gain the ability to integrate LCA results into decision-making processes. Participants will interpret LCA outcomes, identify improvement opportunities, and make informed decisions to optimize processes or products for sustainability.
- Social and Economic Aspects: Understand the integration of social and economic aspects into LCA, comprehending the holistic nature of sustainability that includes social equity and economic viability alongside environmental considerations.
- Practical Application and Analysis: Apply performance evaluation methodologies and LCA principles to real-world scenarios through case studies and practical exercises. Participants will demonstrate their ability to analyze and assess environmental impacts effectively.
- Communication Skills: Develop effective communication skills to articulate LCA findings and performance evaluation results to diverse stakeholders. Participants will be capable of presenting complex environmental assessments in a clear and persuasive manner.
- Ethical Considerations: Understand the ethical implications of performance evaluation and LCA, fostering an awareness of the ethical responsibilities associated with environmental assessments and decision-making.

TEACHING BOARD

- Prof. Dr. Javier Rodrigo-Ilarri, Associate Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)
- Prof. Dr. María-Elena Rodrigo-Clavero, Assistant Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)

CRITERIA FOR SUCCESSFUL COMPLETION OF THE COURSE MODULES

In-class learning activities:

- Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions.
- Students participate in communication activities - individual contact with the teacher, and forum discussions.
- Students participate in activities to verify and evaluate the knowledge acquired within the course module.

Out-of-class assignments:

- Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor.
- Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher.
- Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.
- reinforcing learning by highlighting areas of improvement and reinforcing correct concepts.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

WASTE MANAGEMENT AND INDUSTRIAL POLLUTION CONTROL STANDARDS

SYLLABUS

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Co-funded by the European Union

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Elaborated by	Universitat Politècnica de València **Research institute of Water Engineering and Environment**
Work Package Nº and Title	WP3 - Development
Dissemination Level	International
Language	EN and Spanish

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Waste Management and Industrial Pollution control standards		
Equivalent in ECTS	*1 ECTS*		
Approved by:	UPV Research institute of Water Engineering and Environment		
Date of approval:	01.10.2023		
Duration in hours[1]	25		
Teaching board	Title	Name	e-mail
	Assoc. Prof.	Javier Rodrigo-Ilarri	jrodrigo@upv.es
	Assist. Prof.	Mª Elena Rodrigo-Clavero	marodcla@upv.es

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the content of the waste management and industrial pollution control standard. The following processes are addressed in the course from the perspective of waste production: the analysis of Greenhouse Gas (GHG) emissions, plastic waste recovery, packaging and waste collection and transportation. The course includes the analysis of the content of the following standards: ISO 14064-1:2018, ISO 14064-2:2019, ISO 15270:2008, ISO 18601:2013, ISO 18602:2013 and ISO 24161:2022. The specificity of this study course assumes that the participants are students (bachelor's or master's degree), professionals and external users with a technical profile and knowledge in areas such as Science, Engineering or Business Studies.*
Level:	☒ Undergraduate ☒ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning

[1] To be considered as learning hours.

	☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*No pre-requisites are required.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of Waste Management and Industrial Pollution control standards - To familiarize the students with the main paradigms and concepts related to the standardization process - To acquaint the students with the requirements about GHG emissions established by the standards ISO 14064-1:2019 and ISO 14064-2:2019 - To provide students the guidelines for the recovery and recycling of plastics waste, according to ISO 15270:2008 standard - To provide students with the general requirements for the use of ISO standards in the field of packaging and the environment, as stated on ISO 18061:2013 and ISO 18602:2013 - To introduce the basics of waste collection and transportation management and its vocabulary, as stated by ISO 24161:2022
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered.

	The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers two mandatory modules as follows: Module 1.- Greenhouse gas emissions ☐ 1.1.- Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (ISO 14064-1:2019) ☐ 1.2.- Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements (ISO 14064-2:2019) Module 2.- Plastic waste, packaging and waste collection basics ☐ 2.1. Guidelines for the recovery and recycling of plastics waste (ISO 15270:2008) ☐ 2.2.- General requirements for the use of ISO standards in the field of packaging and the environment (ISO 18601:2013) ☐ 2.3.- Optimization of the packaging system (ISO 18602:2013) ☐ 2.4.- Waste collection and transportation management — Vocabulary (ISO 24161:2022)

Structural unit type	**Total duration in hours:**	**12**
Mandatory Module 1		
Structural unit title	In-class activities duration:	4
Greenhouse gas emissions	Out-of-class activities duration:	8
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher.	

	Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Structural unit type	**Total duration in hours:**	**13**
Mandatory Module 2		
Structural unit title	In-class activities duration:	6
Plastic waste, packaging and waste collection basics	Out-of-class activities duration:	7
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources: - A Corporate Accounting and Reporting Standard. Revised Edition. World Business Council for Sustainable Development and World Resources institute. Accessed on October 2023. https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf - Schaltegger, S. and Burritt, R. Contemporary Environmental Accounting. Routledge Ed. 2017. ISBN 9781351282529 - Lenox, M. and Duff, R. The Decarbonization Imperative: transforming the global economy by 2050. Stanford business Books. 2021. ISBN: 1503614786

	- Poulter, B. (Ed.) Balancing Greenhouse Gas Budgets. Poulter, Benjamin, ed. Balancing Greenhouse Gas Budgets : Accounting for Natural and Anthropogenic Flows of CO2 and Other Trace Gases. Amsterdam, Netherlands; Elsevier, 2022. ISBN: 9780128149539

MODULE 1.- Greenhouse gas emissions

Module Abstract

The "Greenhouse Gas Emissions" module is designed to provide a comprehensive understanding of greenhouse gases, their sources, measurement techniques, impact on climate change, and strategies for mitigation and management. This module aims to equip participants with the knowledge and tools necessary to comprehend, quantify, and address greenhouse gas emissions in various sectors.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- **Understanding ISO 14064 Standards:** Participants will gain a comprehensive understanding of ISO 14064-1:2019 and ISO 14064-2:2019 standards, comprehending their significance, structure, and applicability at both organizational and project levels.
- **Organizational-Level Quantification and Reporting:** Develop proficiency in applying ISO 14064-1:2019 specifications for quantifying and reporting greenhouse gas emissions and removals at the organizational level. Participants will learn to develop comprehensive inventories and reports adhering to ISO standards.
- **Project-Level Quantification and Reporting:** Acquire the skills necessary to utilize ISO 14064-2:2019 guidelines for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements at the project level. Participants will learn to assess and report project-specific emission reductions or enhancements following ISO guidelines.
- **Methodologies and Tools:** Participants will be familiarized with methodologies, tools, and approaches outlined in ISO 14064 standards for quantification, monitoring, and reporting. They will gain hands-on experience in applying these methodologies within organizational and project contexts.
- **Quality Assurance and Control:** Develop proficiency in implementing quality assurance and control measures aligned with ISO 14064 standards. Participants will understand the importance of data integrity, accuracy, and transparency in emission quantification and reporting.
- **Integration into Organizational Practices:** Learn to integrate ISO 14064 specifications seamlessly into organizational practices, ensuring alignment with other management systems and processes to enhance overall sustainability efforts.
- **Interpretation and Application:** Develop the ability to interpret and apply ISO 14064 standards in diverse organizational and project scenarios. Participants will demonstrate their capacity to effectively quantify, monitor, and report greenhouse gas emissions following ISO guidelines.
- **Ethical and Professional Responsibility:** Understand the ethical considerations and professional responsibilities associated with greenhouse gas emission quantification and reporting. Participants will comprehend the significance of transparency, integrity, and ethical conduct in environmental reporting.
- **Communication and Stakeholder Engagement:** Develop effective communication skills to convey

greenhouse gas emission information to stakeholders, fostering engagement and buy-in for emission reduction initiatives.

MODULE 2.- Plastic waste, packaging and waste collection basics

Module Abstract

The module on "Plastic Waste, Packaging, and Waste Collection Basics" provides a comprehensive exploration of critical facets within the realm of plastic waste management, packaging optimization, and efficient waste collection practices, incorporating guidelines outlined in ISO standards such as ISO 15270:2008, ISO 18601:2013, ISO 18602:2013, and ISO 24161:2022.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- **Plastics Waste Recovery and Recycling (ISO 15270:2008):** Understand the principles and methodologies outlined in ISO 15270:2008 for the recovery and recycling of plastics waste. Participants will grasp the requirements for effective and sustainable plastics recycling practices.
- **Utilizing ISO Standards in Packaging and Environment (ISO 18601:2013):** Gain insights into ISO 18601:2013, comprehending the general requirements for utilizing ISO standards in packaging practices aligned with environmental considerations. Participants will understand the implications for environmentally conscious packaging.
- **Packaging System Optimization (ISO 18602:2013):** Develop skills in optimizing packaging systems as per ISO 18602:2013 guidelines. Participants will learn strategies to enhance packaging efficiency, reduce environmental impact, and foster sustainable packaging practices.
- **Waste Collection and Transportation Management Vocabulary (ISO 24161:2022):** Familiarization with ISO 24161:2022 vocabulary and terminologies related to waste collection and transportation management. Participants will acquire standardized terms and definitions to facilitate effective communication and comprehension in waste management practices.
- **Quality Assurance and Compliance:** Understand the significance of quality assurance, compliance, and adherence to ISO standards in ensuring effective plastic waste recovery, sustainable packaging, and efficient waste collection practices.
- **Ethical and Environmental Responsibility:** Comprehend the ethical responsibilities associated with adhering to ISO standards in plastic waste management, packaging, and waste collection. Participants will recognize the importance of ethical conduct and environmental stewardship in implementing these standards.

TEACHING BOARD

- Prof. Dr. Javier Rodrigo-Ilarri, Associate Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)
- Prof. Dr. María-Elena Rodrigo-Clavero, Assistant Professor of the Research Institute of Water Engineering and Environment (IIAMA) of the Universitat Politècnica de València (UPV)

CRITERIA FOR SUCCESSFUL COMPLETION OF THE COURSE MODULES

In-class learning activities:

- Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions.
- Students participate in communication activities - individual contact with the teacher, and forum discussions.
- Students participate in activities to verify and evaluate the knowledge acquired within the course module.

Out-of-class assignments:

- Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor.
- Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher.
- Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

- reinforcing learning by highlighting areas of improvement and reinforcing correct concepts.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

ANDRAGOGICAL TECHNOLOGIES AND SAFE ENVIRONMENT

SYLLABUS

MYKOLAS ROMERIS UNIVERSITY

Co-funded by the European Union

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Elaborated by	Mykolas Romeris University **Faculty of Human and Social Studies**
Work Package № and Title	WP3 - Development
Dissemination Level	International
Language	EN and Lithuanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Andragogical technologies and safe environment
Equivalent in ECTS	*1 ECTS*
Approved by:	Counsel of Human and Social Studies Faculty
Date of approval:	2023
Duration in hours[1]	27
Teaching board	Title / Name / e-mail Prof. dr. / Irena Zemaitaityte / irene@mruni.eu Lect. / Agata Katkoniene / agata.katkoniene@mruni.eu

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the main concepts and terms related to adult education and learning society, the learning technologies, safe environment and educational organization introduced by EN ISO 21001:2018, EN ISO 14040:2006 and EN ISO 56000:2021 standards.* *The specificity of this study course assumes that the participants are students (master's degree), professionals and external users with a technical profile and knowledge in areas such as andragogy, teaching and learning, learning environment.*
Level:	☐ Undergraduate ☒ Graduate ☐ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University

[1] To be considered as learning hours.

	☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☒ In person ☐ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an educational background in the social science.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of andragogy technologies, life-long learning and learning society models; - To familiarize the students with the main paradigms and concepts related to the standardization process. - To provide participants with a fundamental understanding of the concept of standards and standardization, their importance, and their role in various industries and fields - To acquaint the students with the Innovation management terminology according to standard EN ISO 56000:2021; - To provide students with theoretical and practical knowledge of educational organizations, the requirements for management systems for educational organizations, as well as the principles and requirements for their operation according to EN ISO 21001:2018 standard; - To familiarize the students with the fundamental paradigms, principles and framework related to environmental management, life cycle assessment according to the standard EN ISO 14040:2006.
Pedagogical methods	The pedagogical/andragogical methods for the course on "Andragogical technologies and safe environment " should be designed to engage participants, encourage critical thinking, foster practical skills, and promote active application of knowledge. Here are pedagogical/andragogical methods that will be employed in this course: Lectures and Discussions, Case Studies, Demonstration Group Projects and Collaborative Learning
Communication system	The communication system fosters an interactive and engaging learning environment, allowing for effective knowledge transfer and application of andragogical technologies principles within safe environment. For an in-person course on " Andragogical technologies and safe environment," an effective communication system involves various methods to facilitate interaction, collaboration, and the exchange of information among participants, instructors, and stakeholders: - Small Group Activities and Workshops - Projects, classroom Presentations and Lectures Feedback and Evaluation the training course is also available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place in face to face meeting

	and through the electronic communication channels regulated in the educational institution.
Evaluation methods	A combination of evaluation methods ensures a holistic assessment of participants' knowledge, skills, and engagement in the course. - Attendance and quality of active participation during lecture and seminar discussions, formulating questions, making critical comments, exercising individual and group task; - Demonstration of practical training with acquired knowledge and skills; - Open questions exam.
Criteria for successful completion	For successful completion of the course " Andragogical technologies and safe environment " based on the provided evaluation components, the following criteria can be established: - Attendance and Quality of Participation: - Attend a minimum of 70 % of lectures and seminars. - Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks. - Demonstration of practical training with acquired knowledge and skills: - Attracting and activating learning participants; - Clear presentation of the topic; - Demonstration of andragogic knowledge and competences. - Open questions exam.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course " Andragogical technologies and safe environment" is organized on a modular basis and covers three mandatory modules as follows: Module 1: Andragogy theories and models, standardization and standard "innovation management" - Andragogy theories and adults learning models; - General information regarding the standards and standardization - Common international terminology for Innovation management - Fundamentals and vocabulary, according to standard EN ISO 56000:2021. Module 2: Learning society and Learning organization - Learning society models and transformation; - The requirements for the creation and development of Educational organizations — Management systems for educational organizations according to the EN ISO 21001:2018 standard. Module 3: Adult education and safe environment - Adult learning environment; Environment as adult learning motivation factor and the role of technologies in adult teaching and learning.

	- Environmental management, Life cycle assessment, Principles and framework according to the EN ISO 14040:2006 standard;

Structural unit type	**Total duration in hours:**	**27**
Mandatory Module 1		
Structural unit title	In-class activities duration:	10
Circular Economy, Standardization and Standards, Energy Efficiency and Renewable Energy Sources (RES)	Out-of-class activities duration:	17
In-class learning activities	Assimilative Activities: engaging lectures and presentations; reading assignments. Productive Activities: group work activities Communication Activities: group and in pair discussions; group reflection. Activities of Finding and Handling Information: exploration of online resources, information on standards. Assessment Activities: Evaluation (open questions exam); self-assessment and reflection. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Cumulative assessment methodology. The assessment consists of an assessment of the completion of assignments and a final course examination (open questions exam). Students are involved in the process of self-evaluation: they reflect on their achievements at the end of the seminars and take self-evaluation tests.

Instructional Materials and References for the course	Shumakova, N. A., & Savelyeva, M. V. (2019, May). Training technologies for Industry 4.0 experts: updated andragogical model. In *IOP Conference Series: Materials Science and Engineering* (Vol. 537, No. 4, p. 042050). IOP Publishing. Amiruddin, A., Baharuddin, F. R., Takbir, T., Setialaksana, W., & Hasim, M. (2023). Pedagogy-Andragogy Continuum with Cybergogy to

Promote Self-Regulated Learning: A Structural Equation Model Approach. *European Journal of Educational Research*, *12*(2), 811-824.

Darwin, C. (2017). Building a learning organization. *Knowledge solutions*, *57*(54), 78-99.

Örtenblad, A. (2018). What does "learning organization" mean?. *The Learning Organization*, *25*(3), 150-158.

Boud, D. (2000). Sustainable assessment: rethinking assessment for the learning society. *Studies in continuing education*, *22*(2), 151-167.

Jarvis, P. (2008). *Democracy, lifelong learning and the learning society: Active citizenship in a late modern age*. Routledge.

Griffin, C., & Brownhill, B. (2014). The learning society. In *The age of Learning* (pp. 55-68). Routledge.

Stiglitz, J. E., & Greenwald, B. C. (2015). *Creating a learning society: A new approach to growth, development, and social progress*. Columbia University Press.

ISO 56000:2021 Innovation management - Fundamentals and vocabulary https://www.iso.org/standard/69315.html

ISO 21001:2018 Educational organizations — Management systems for educational organizations https://www.iso.org/standard/66266.html

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework https://www.iso.org/standard/37456.html

Course modules description

Module 1 **Andragogy theories and models, standardization and standard "Innovation management"**

Module Abstract

The module aims to familiarize the students with the concepts of andragogy technologies, life-long learning and learning society models; to familiarize the students with the main paradigms and concepts related to the standardization process; to provide participants with a fundamental understanding of the concept of standards and standardization, their importance, and their role in various industries and fields; to acquaint the students with the Innovation management terminology according to standard EN ISO 56000:2021.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

You will know the concepts of andragogy technologies, life-long learning and learning society models;

you will have skills how to organize adult education in using general standarts and standartization

you will develop an attitude the Innovation management terminology according to standard EN ISO 56000:2021.

Criteria for successful completion of the module

Attend a minimum of 70 % of lectures and seminars.

- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.
- Demonstration of practical training with acquired knowledge and skills:

Module Assessment

- Clear presentation of the topic;
- Demonstration of andragogic knowledge and competences.

Module 2 **Learning society and Learning organization**

Module Abstract

The module aims to provide students with theoretical and practical knowledge of educational organizations, the requirements for management systems for educational organizations, as well as the principles and requirements for their operation according to EN ISO 21001:2018 standard.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

You will know theoretical and practical knowledge about learning society, educational and learning organizations;

you will have skills and will develop an attitude about the requirements for management systems for educational organizations, as well as the principles and requirements for their operation according to EN ISO 21001:2018 standard.

Teaching board (OPTIONAL)

the instructors responsible for this module is prof. dr. Irena Zemaitaityte .

Criteria for successful completion of the module

Attend a minimum of 70 % of lectures and seminars.

- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.

- Demonstration of practical training with acquired knowledge and skills:

Module Assessment

- Clear presentation of the topic;
- Demonstration of andragogic knowledge and competences.

Module 3 **Adult education and safe environment**

Module Abstract

The module aims is familiarize the students with adult learning environment; environment as adult learning motivation factor and the role of technologies in adult teaching and learning; with the fundamental paradigms, principles and framework related to environmental management, life cycle assessment according to the standard EN ISO 14040:2006.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

You will know theoretical and practical knowledge adult learning environment;

you will have skills how to development adult learning motivation and how to use technologies in adult teaching and learning;

you will develop an attitude about principles and framework related to environmental management, life cycle assessment according to the standard EN ISO 14040:2006.

Criteria for successful completion of the module

Attend a minimum of 70 % of lectures and seminars.

- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.
- Demonstration of practical training with acquired knowledge and skills:

Module Assessment

- Clear presentation of the topic;
- Demonstration of andragogic knowledge and competences.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

SOCIAL RESPONSIBILITY AND CAREER MANAGEMENT

SYLLABUS

MYKOLAS ROMERIS UNIVERSITY

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Elaborated by	Name of the University: Mykolas Romeris University
Work Package № and Title	WP3 - Development
Dissemination Level	International
Language	EN and Lithuanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Social Responsibility and Career Management		
Equivalent in ECTS	*1 ECTS*		
Approved by[1]:	*Faculty of Human and Societal Studies*		
Date of approval:			
Duration in hours[2]			
Teaching board	Title	Name	e-mail
	Prof. dr.	Asta Railienė	asta.railiene@mrurni.eu
	Prof. dr.	Odeta Merfeldaitė	o.merfeldaite@mrurni.eu

Section 2. PROGRAM INFORMATION

Trainees profile:	*Master's students in Education and Social Work*
Level:	☐ Undergraduate ☒ Graduate ☐ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☒ In person ☐ Online ☐ Hybrid

[1] The proposed micro-credential should be recognized as a "university-approved" program. This requires the approval process at the level of the department/unit/faculty in line with the internal rules and policy of the university adopted for the approval of traditional training programs.
[2] To be considered as learning hours.

Pre-requisite (s)	*It requires the course participants to have an educational background in the social science (in field of social work or education).*
Learning Objectives	The main objectives of the course are: - to familiarize students with the fundamental concepts and processes involved in career management - to provide students with a fundamental understanding of the concept of standards and standardization, their importance, and their role in various industries and fields - to introduce students to the underlying theoretical concepts of social responsibility and how they are encapsulated within the ISO 26000:2010 guidelines, and how integrate social responsibility principles into career management, thereby fostering a workforce and business environment that is ethically conscious, socially responsible, and sustainable. - to provide students with theoretical and practical knowledges of how principles of project management (ISO 21500:2021) and risk management (ISO 31073:2022) can significantly contribute to individual career development, advancement, career resilience and adaptability in the face of evolving professional challenges and opportunities - to provide participants with a comprehensive understanding of the concept of sustainable careers, emphasizing the importance of aligning personal and professional career development with principles of environmental and social responsibility aligning with EN ISO 14001:2015, and how these practices can positively impact their professional growth.
Pedagogical methods	Engaging lecture, group work, case study, research project, reflection, feed-back, open-ended questions and creative tasks test
Communication system	The communication system is based on mutual cooperation, interaction, reflection and feedback. Students are encouraged to speak and share their experiences from the position of "I". This promotes an interactive, engaging and safe learning environment. During the workshops, rules for group work are agreed.
Evaluation methods	A combination of evaluation methods ensures a holistic assessment of participants' knowledge, skills, and engagement in the course. - Active participation during lecture and seminar discussions, formulating questions, making critical comments, exercising individual and group task; - Knowledge evaluation single choice set quiz after each module; - Preparation of practical task – organization case analysis.
Criteria for successful completion	- Quality of participation in the learning process: attendance at least 70% of lectures and seminars; active participation in discussions, group reflection; engagement in group tasks - Completion of assignments: submission of all necessary assignments by the deadline. The following aspects of the case analysis are assessed: a brief description of the organization; description of staff requirements; description of the staff selection process in the

	organization; an analysis of the staff development system in the organization; an analysis of the employee motivation system; a discussion of employee performance appraisal; an overview of the standards applied in the organization.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	Module 1: Theoretical backgrounds of career management and general information regarding the standards and standardization *Topic 1: Career Management: Concept, Process and Relevance* Topic 2: General information regarding the standards and standardization Module 2. Social Responsibility in The Context of Career Management *Topic 1: Theoretical Backgrounds of Social Responsibility in relation with Guidance on social responsibility ISO 26000:2010* *Topic 2:* Integrating Social Responsibility principles (ISO 26000:2010) in Career Management Module 3. Project Management, Risk Management and Career Development *Topic 1:* Project Management (ISO 21500:2021) and Career Growth *Topic 2:* Risk Management (ISO 31073:2022) and Career Resilience Module 4. Environmental Responsibility and Sustainable Careers *Topic 1:* Understanding sustainable careers *Topic 2:* Sustainable Career Management within Environmental Management Context (EN ISO 14001:2015)

Structural unit type Module/lecture/exercise/etc.	**Total duration in hours:**	**27**
Structural unit title	In-class activities duration:	10
	Out-of-class activities duration:	17
In-class learning activities	Assimilative Activities: engaging lectures and presentations; reading assignments. Productive Activities: group work activities Communication Activities: group and in pair discussions; group reflection. Activities of Finding and Handling Information: exploration of online resources, information on standards. Assessment Activities: Examinations (test and case analyses); self-assessment and reflection.	
Out-of-class assignments	Assimilative Activities: reading and analyzing of scientific literature and additional learning materials Communication Activities: on-line communication with course colleagues and teacher Activities of Finding and Handling Information: exploration of online resources, information on standards.	

	Assessment Activities: case analyses; career management competencies portfolio

Tools and methods used for formative and summative assessment	Cumulative assessment methodology. The assessment consists of an assessment of the completion of individual task (case analysis) and knowledge evaluation single choice set quizzes after each module. Students are involved in the process of self-evaluation: they reflect on their achievements at the end of the seminars and take self-evaluation tests.

Instructional Materials and References for the course	Akkermans, J., De Vos, A., & Van der Heijden, B. (2016). Going the distance: Conceptualizing and examining the sustainable career. Academy of Management Submission, (14372). Bagdadli, S., & Gianecchini, M. (2019). Organizational career management practices and objective career success: A systematic review and framework. Human Resource Management Review, 29(3), 353-370 Baruch, Y. (2015). Organizational and Labor Markets as Career Ecosystem / In De Vos, A., Van der Heijden, B. I. J. M., Handbook of Research on Sustainable Careers, Edward Elgar Publishing. pp. 364–380. doi:10.4337/9781782547037.00029 Baruch, Y., & Vardi, Y. (2016). A Fresh Look at the Dark Side of Contemporary Careers: Toward a Realistic Discourse. *British Journal of Management*, *27*(2), 355–372. DOI: 10.1111/1467-8551.12107. Callanan, G.A., Perri, F. D. & Tomkowicz, S. M. (2017). Career Management in Uncertain Times: Challenges and Opportunities. *The career Development Quarterly, 65*(4), 353-365. Prieiga per internetą https://doi.org/10.1002/cdq.12113 De Vos, A., Dewettinck, K., & Buyens, D. (2009). The professional career on the right track: A study on the interaction between career self-management and organizational career management in explaining employee outcomes. European Journal of Work and Organizational Psychology, 18(1): 55-80. De Vos, A., Van der Heijden, B. I.J.M, Akkermans, J. (2018). Sustainable careers: Towards a conceptual model. Journal of VFcuocational Behavior, Vol. 117: 1-13. ISO 14001:2015 Environmental management systems - Requirements with guidance for use ISO 21500:2021 Project, programme and portfolio management — Context and concepts ISO 26000:2010. Guidance on social responsibility ISO 31073:2022 Risk management — Vocabulary

Paradnikė, K., Endriulaitienė, A., & Bandzevičienė, R. (2016). Career self-management resources in contemporary career frameworks: A literature review. Management of Organizations: Systematic Research, Vol.76: 91-106.

Rapuano, V. (2020). Toward Sustainable Careers: Literature Review, Contemporary Research on Organization Management and Administration, Vol. 8 (1), 41 – 54

Van der Heijden, B. I., & De Vos, A. (2015). Sustainable careers: Introductory chapter. In Handbook of research on sustainable careers (pp. 1-19). Edward Elgar Publishing.

Wesarat, Ph.-On & Sharif, M. & Majid, A. (2014). A Review of Organizational and Individual Career Management: A Dual Perspective. International Journal of Human Resource Studies, 4 (1), 101-113. DOI: 10.5296/ijhrs.v4i1.5331

Course modules description

MODULE 1. Theoretical backgrounds of career management and general information regarding the standards and standardization

Module Abstract

The module delves into the fundamental concepts, processes, and relevance of career management, offering participants a comprehensive understanding of career development from an individual and organizational perspective. It also introduces the concept of standards and standardization, providing a foundational understanding of how standards like ISO influence various aspects of career management and organizational practices. This module sets the stage for integrating career management with broader concepts like social responsibility and environmental sustainability.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *To know concepts and process of career management and to understand the relevance of career management for individuals and organizations*
- *To know and understand the concept of standards and standardization, their importance, and their role in various industries and fields*

Criteria for successful completion of the module

Successful completion of post-module quiz

MODULE 2. Social responsibility in the context of career management

Module Abstract

In the module, the focus shifts to the interplay between social responsibility and career management. Here, the theoretical backgrounds of social responsibility are explored, particularly in relation to the Guidance on social responsibility provided by ISO 26000:2010. Participants will learn how to integrate the principles of social responsibility into career management practices, ensuring that career growth aligns with ethical and socially responsible standards. This module emphasizes the importance of adopting a socially responsible approach in career managing processes.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *to know and understand theoretical concepts of social responsibility and how they are encapsulated within the ISO 26000:2010 guidelines.*
- *to know and understand how effectively integrate social responsibility principles into career management, thereby fostering a workforce and business environment that is ethically conscious,*

socially responsible, and sustainable.

Criteria for successful completion of the module
Successful completion of post-module quiz

MODULE 3. Project management, risk management and career development

Module Abstract
The module examines the application of project management (ISO 21500:2021) and risk management (ISO 31073:2022) principles to career development. It explores how techniques and frameworks from these areas can enhance career growth and resilience. Participants will understand how to apply project management skills to their career planning and execution, as well as how to use risk management strategies to build career resilience.

Learning outcomes
After studying this module, you will achieve the following learning outcomes:

- *To know and understand how principles of project management per ISO 21500:2021 can significantly contribute to individual career development and advancement.*
- *To know and understand how the principles of ISO 31073:2022 can be effectively applied to enhance individual career resilience and adaptability in the face of evolving professional challenges and opportunities.*

Criteria for successful completion of the module
Successful completion of post-module quiz

MODULE 3. Environmental responsibility and sustainable careers

Module Abstract
The module introduces the concept of sustainable careers and how they can be managed within the context of environmental management (EN ISO 14001:2015). It covers the importance of aligning career paths with environmental responsibility, emphasizing the role of sustainability in modern career trajectories. Participants will learn how to incorporate environmental considerations into their career decisions, ensuring that their professional growth contributes to, and aligns with, broader environmental sustainability goals. This module is crucial for fostering an understanding of the role individual career choices play in the global sustainability agenda.

Learning outcomes
After studying this module, you will achieve the following learning outcomes:

- *To know and understand the concept of sustainable careers, emphasizing the importance of aligning personal and professional career development with principles of environmental and social*

responsibility, and to inspire individuals to make informed, ethically responsible career choices that contribute to long-term personal satisfaction, societal well-being, and environmental sustainability.

- *To know and understand how individuals can contribute to environmental sustainability in their careers, aligning with EN ISO 14001:2015, and how these practices can positively impact their professional growth.*

Criteria for successful completion of the module
Successful completion of post-module quiz

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

Social Responsibility in Family Work

SYLLABUS

MYKOLAS ROMERIS UNIVERSITY

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Elaborated by	Name of the University: Mykolas Romeris university
Work Package № and Title	WP3 - Development
Dissemination Level	International
Language	EN and Lithuanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Social responsibility in family work		
Equivalent in ECTS	1		
Approved by[1]:	Faculty of Human and Societal Studies		
Date of approval:			
Duration in hours[2]	27		
Teaching board	Title	Name	e-mail
	Lecturer	Agata Katkonienė	agata.katkoniene@mruni.eu
	Prof. dr.	Irena Žemaitaitytė	irene@mrurni.eu

Section 2. PROGRAM INFORMATION

Trainees profile:	*The program is likely designed to educate and empower this diverse audience to better understand, implement, and promote social responsibility within the family unit, fostering a sense of community and contributing positively to society. The intended audience for a program titled "Social responsibility in family work" would typically include individuals, professionals, and organizations involved in family-related services, programs, and initiatives aimed at promoting social responsibility within the context of family dynamics and interactions.*
Level:	☒ **Undergraduate** ☐ Graduate ☐ Undergraduate and Graduate ☐ Life-long learning ☐ Professional development

[1] The proposed micro-credential should be recognized as a "university-approved" program. This requires the approval process at the level of the department/unit/faculty in line with the internal rules and policy of the university adopted for the approval of traditional training programs.
[2] To be considered as learning hours.

Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☐ External trainees
Instruction method:	☒ In person ☐ Online ☐ Hybrid
Pre-requisite (s)	*Social Work theory and practice; Social Work Methodology*
Learning Objectives	The learning objectives for a course on "Social Responsibility in Family Work" would focus on equipping participants with knowledge, skills, and attitudes necessary to understand, promote, and integrate social responsibility within the context of family dynamics and interactions: - Understanding Social Responsibility in the Family Context - Exploring Cultural and Societal Influences on Family Social Responsibility. - Developing Skills for Implementing Social Responsibility in Family Settings.
Pedagogical methods	The pedagogical methods for the course on "Social Responsibility in Family Work" should be designed to engage participants, encourage critical thinking, foster practical skills, and promote active application of knowledge. Here are pedagogical methods that will be applied in this course: - Lectures and Discussions - Case Studies - Group Projects and Collaborative Learning
Communication system	The communication system fosters an interactive and engaging learning environment, allowing for effective knowledge transfer and application of social responsibility principles within family work. For an in-person course on "Social Responsibility in Family Work," an effective communication system involves various methods to facilitate interaction, collaboration, and the exchange of information among participants, instructors, and stakeholders: - Classroom Presentations and Lectures - Small Group Activities and Workshops - Feedback and Evaluation
Evaluation methods	A combination of these evaluation methods ensures a holistic assessment of participants' knowledge, skills, engagement, and application of social responsibility principles within the family work context. - Attendance and quality of active participation during lecture and seminar discussions, formulating questions, making critical comments, exercising individual and group task - Written Assignments: Assign essays or research papers on topics related to social responsibility in family work.
Criteria for successful completion	For successful completion of the course "Social Responsibility in Family Work" based on the provided evaluation components, the following criteria can be established:

	- **Attendance and Quality of Participation:** - Attend a minimum of 80 % of lectures and seminars. - Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks. - **Written Assignments:** - Submit all required written assignments by the specified deadlines. - Demonstrate a comprehensive understanding of the assigned topics related to social responsibility in family work. - Present well-structured essays or research papers with coherent arguments, proper citations, and adherence to academic writing conventions.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	**Module 1: Introduction to Social Responsibility in Family Work** Topic 1: Understanding Social Responsibility: Concepts and Principles Nugget 1.1: Guidance on Social Responsibility (ISO 26000:2010) Nugget 1.2: General Information Regarding the Standards and standardization Nugget 1.3: Ethical Foundations of Social Responsibility **Module 2: Cultural and Societal Influences on Family Social Responsibility** Topic 1: Cultural Perspectives on Family Social Responsibility Nugget 1.1: Cultural Variations and Societal Norms in Social Responsibility Practices Nugget 1.3: Women's Entrepreneurship — Key Definitions and General Criteria (IWA 34:2021) **Module 3: Developing Skills for Implementing Social Responsibility in Family Settings** Topic 1: Effective Communication and Conflict Resolution Nugget 1.1: Active Listening and Empathetic Communication Nugget 1.2: Conflict Resolution Strategies

Structural unit type Module/lecture/exercise/etc.	**Total duration in hours:**	**27**
Structural unit title	In-class activities duration:	10
	Out-of-class activities duration:	17
In-class learning activities	***Lecture Presentations:*** *Description: Instructors present lectures covering the fundamental concepts of social responsibility in family work, incorporating visuals and engaging discussions.*	

	Objective: Assimilate knowledge and understanding of social responsibility principles. ***Reading Assignments and Literature Review:*** *Description: Assign readings, articles, and research papers related to family dynamics and social responsibility for participants to review and summarize.* *Objective: Assimilate diverse perspectives and theories related to the topic.*
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students will complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students will complete practical assignments with assessment. At the end of each module, students will complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	1. Blanch A. and Aluja A. Social support (family and supervisor), work-family conflict, and burnout: Sex differences. Human Relations. 65: 811 (2012) 2. Brush, C. G., De Bruin, A., & Welter, F. (2009). A gender-aware framework for women's entrepreneurship. International Journal of Gender and entrepreneurship, 1(1), 8-24. 3. Corporate Social Responsibility for Work/Family Balance Symposium: People of Color, Women, and the Public Corporation O'Connor, Marleen A. 4. Donnellan, Helen; Jack, Gordon. Survival Guide for Newly Qualified Child and Family Social Worker : Hitting the Ground Running. London: Jessica Kingsley Publishers, 2009. 224 p. ISBN 978-1-84310-989-1. 5. Guidance on Social Responsibility (ISO 26000:2010) 6. López Davis S., Marín Rives L., Ruiz de Maya S., Introducing Personal Social Responsibility as a key element to upgrade CSR, Spanish Journal of Marketing - ESIC, Volume 21, Issue 2, 2017, Pages 146-163, ISSN 2444-9695,

7. Mattison, M. (2000). Ethical decision making: The person in the process. Social Work, 45(3), 201-212.
8. Reamer, F. G. Social Work Values and Ethics. New York: Columbia University Press, 2006. 240 p. ISBN 978-0-231-13788-1.
9. White, J. M., Martin, T. F., & Adamsons, K. (2018).Family theories: An introduction. Sage Publications.
10. Women's Entrepreneurship — Key Definitions and General Criteria (IWA 34:2021)
11. Yadav, V., & Unni, J. (2016). Women entrepreneurship: research review and future directions. Journal of Global Entrepreneurship Research, 6, 1-18.

Course modules description

Module 1: Introduction to Social Responsibility in Family Work

Module Abstract

Module 1 provides an introductory exploration of Social Responsibility in Family Work, encompassing two key topics. Topic 1 delves into the realm of Standards and Standardization, offering a comprehensive overview of general information in this domain. Topic 2 centers on the fundamentals of Social Work with Family, aiming to enhance understanding and proficiency in this crucial aspect of social responsibility. Together, these topics lay the groundwork for a comprehensive understanding of ethical obligations and practical skills within the context of family-focused social work.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *Gain a thorough understanding of the general information pertaining to standards and standardization in the context of family work.*
- *Develop a foundational understanding of the basics of social work tailored specifically to family dynamics.*

Teaching board (OPTIONAL)

the instructors responsible for this module is Agata Katkoniene and prof. dr. Irena Zemaitaityte.

Criteria for successful completion of the module

- Attend a minimum of 80 % of lectures and seminars.
- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.

Module Assessment

- Students will complete practical assignments with assessment.

- At the end of each module, students will complete a test to verify and evaluate the knowledge acquired within the module.

Module 2: Cultural and Societal Influences on Family Social Responsibility

Module Abstract

Module 2 delves into the profound impact of Cultural and Societal Influences on Family Social Responsibility, encompassing two key topics. Topic 1 focuses on Women's Entrepreneurship, exploring key definitions and general criteria as outlined in IWA 34:2021. Participants will gain insight into the standards governing women's entrepreneurship, fostering an understanding of the broader societal context. In Topic 2, the module examines the dynamic Roles of Women within the Family, shedding light on the diverse and evolving responsibilities women undertake in familial settings.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *Familiarize oneself with the specific guidelines and criteria established by IWA 34:2021*
- *Explore and recognize the diverse roles that women play within the family structure.*

Teaching board (OPTIONAL)

The instructors responsible for this module is Agata Katkoniene and prof. dr. Irena Zemaitaityte .

Criteria for successful completion of the module

- Attend a minimum of 80 % of lectures and seminars.
- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.

Module Assessment

- Students will complete practical assignments with assessment.

- At the end of each module, students will complete a test to verify and evaluate the knowledge acquired within the module.

Module 3: Developing Skills for Implementing Social Responsibility in Family Settings

Module Abstract

Module 3: Developing Family Counseling Competencies focuses on enhancing practitioners' proficiency in family counseling through a dual exploration of key topics. In Topic 1, participants delve into the Guidance on Social Responsibility as outlined by ISO 26000:2010, tailoring these principles to the specific context of family counseling. Topic 2 guides participants in Integrating Social Responsibility Principles in Family Counseling. Through practical applications, participants learn how to seamlessly weave ethical considerations into their counseling methodologies. By engaging with these topics, participants develop the competencies essential for navigating the complexities of family dynamics with sensitivity, integrity, and a commitment to social responsibility.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- *Gain a thorough comprehension of the key principles and guidance outlined in ISO 26000:2010.*
- *Improve counseling competencies to effectively convey social responsibility principles to families, fostering understanding and collaboration.*

Criteria for successful completion of the module

- Attend a minimum of 80 % of lectures and seminars.
- Actively participate in discussions, asking questions, offering critical comments, and engaging in group and individual tasks.

Module Assessment

- Students will complete practical assignments with assessment.
- At the end of each module, students will complete a test to verify and evaluate the knowledge acquired within the module.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

RISK MANAGEMENT IN BIOECONOMY

SYLLABUS

UNIVERSITY OF LIFE SCIENCES „KING MIHAI I" FROM TIMISOARA

Co-funded by the European Union

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Elaborated by	UNIVERSITY OF LIFE SCIENCES„KING MIHAI I" FROM TIMISOARA **Faculty of Engineering and Applied Technologies**
Work Package Nº and Title	WP3 - Development
Dissemination Level	International
Language	EN and Romanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Risk management in bioeconomy
Equivalent in ECTS	4 ECTS
Approved by:	ULS Senate
Date of approval:	22.09.2023
Duration in hours[1]	100
Teaching board	Title / Name / e-mail Prof. habil. / Tulcan Camelia / tulcancamelia@gmail.com, cameliatulcan@usvt.ro Prof. / Popescu Sorina / sorinapopescu@usvt.ro, sorinapopescutm@gmail.com

Section 2. PROGRAM INFORMATION

Trainees profile:	*This comprehensive course aims to familiarize students with basic concepts and Risk management terms. The specific concepts, frameworks, techniques, and regulatory aspects of risk management are discussed in both the context of a general organization and in the specific case of the bioeconomy framework. The focus of the course is on critical thinking about risk and implementing risk management according to ISO 31000:2018, ISO EN IEC 31010:2020, ISO EN 22005:2007, ISO 31073:2022, ISO IWA31:2020.* *This course focused on risk management will also cover the basics of the more specialized topic addressed to course participants from the bioeconomy field, namely traceability in the feed and food chain.*

[1] To be considered as learning hours.

	The specificity of this training course assumes that the course participants are students (bachelor's or master's degree), professionals and other external users with various profiles from the bioeconomy field.
Level:	☐ Undergraduate ☐ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an economic educational background.*
Learning Objectives	The main objectives of the course are: - to provide participants the knowledge and practical skills regarding the basic vocabulary, concepts of risk management (risk-threat or opportunity, business-specific risk categories, formal organization of risk management, international risk management methodologies) -to familiarize the students with the risk management process (identification, assessment of risks, development of risk response strategies, monitoring, reporting, and control of risks). - to acquaint students with the vocabulary and definitions related to risk management according to standard ISO 31073:2022; - to acquaint students some basic skills which will help them to start working in any organization or company that manages risk or have integrated risk management in its governance, following the recommendations of ISO 31000:2018; - to acquaint students to select and apply various techniques that can be used to help understand risk and uncertainty, according to ISO 31010:2019; - to provide the guidance for properly integration of the ISO 31000 standard (Risk Management – Guidelines) in organizations that have already implemented or are in the process of implementing one or more management systems according to IWA 31:2020; - to acquaint students with some basic knowledge and practical skills in feed and food chain traceability requirements according EN ISO 22005:2007.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and

	demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, and participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 4 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers five mandatory modules. **Module 1:** Risk management vocabulary - Scope of standard ISO 31073:2022 - Terms related to risk, risk management and risk management process **Module 2:** Risk management guidelines - Scope of standard ISO 31000:2018- - The common concept of risk; - ISO 31000 basic concepts, terms and definitions about risk management; - Risk management principles; - Risk management framework; - Risk management process. **Module 3:** Risk assessment techniques - Scope of standard IEC 31010:2019 - Plan the risk assessment - Managing information and develop models - Apply risk assessment techniques – Review the Analysis

	– Apply Results to Support Decisions – Record and Report Risk Assessment Process and Outcomes – Selecting Risk Assessment Techniques: Brainstorming, Delphi Technique, Nominal Group Technique, Structured or Semi-Structured Interviews, Checklists, Classifications, and Taxonomies, Failure Modes and Effects Analysis (FMEA), Scenario Analysis, Ishikawa Analysis (Fishbone) Method, Business Impact Analysis (BIA), Event Tree Analysis, Fault Tree Analysis, Human Reliability Analysis, Privacy Impact Analysis (PIA), Value at Risk (VaR), Pareto Charts, Cost/Benefit Analysis (CBA), Decision Tree Analysis, Multi-criteria Analysis (MCA), Risk Register, Consequence/Likelihood Matrix; **Module 4:** Risk management guidelines on using ISO 3100 in management systems. - Scope of standard IWA 31:2020 - Integrated management systems and using ISO 31000; - Application of risk management in the existing quality management system (QMS). **Module 5:** Traceability in the feed and food chain - Scope of standard EN ISO 22005:2007 - Principles and objectives of traceability - System design and implementation - Internal evaluation audits - System assessment and review

Structural unit type Module 1	**Total duration in hours:**	**14**
Structural unit title	In-class activities duration:	8
Risk management vocabulary	Out-of-class activities duration:	6
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	20
Module 2		
Structural unit title	In-class activities duration:	12
Risk management guidelines	Out-of-class activities duration:	8
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	46
Module 3		
Structural unit title	In-class activities duration:	24
Risk assessment techniques	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	6
Module 4		
Structural unit title	In-class activities duration:	4

Risk management guidelines on using ISO 3100 in management systems	Out-of-class activities duration:	2
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type Module 5	**Total duration in hours:**	**14**
Structural unit title	In-class activities duration:	8
Traceability in the feed and food chain	Out-of-class activities duration:	6
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.
Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic. - ISO 31000:2018 Risk management — Guidelines - ISO 31073:2022 Risk management — Vocabulary - EC 31010:2019 Risk management -Risk assessment techniques - IWA 31:2020 Risk management — Guidelines on using ISO 31000 in management systems - EN ISO 22005:2007 Traceability in the feed and food chain — General principles and basic requirements for system design and implementation - Interoperable EU Risk Management Toolbox - https://www.enisa.europa.eu/publications/interoperable-eu-risk-management-toolbox - David Vose (2012) – Risk Analysis- a quantitative guide, ISBN-13. 978-0470512845, Wiley; - Norman Marks (2023)- World-Class risk Management, ISBN-13 : 979-8378722945 - Paul Hopkins (2017) – Fundamentals in risk management, ISBN 978 0 7494 7961 9, Croydon, London

Course modules description

MODULE 1 Description

Risk management vocabulary

Risk management – Vocabulary deals specifically with risk management terminology and is intended to be read alongside ISO 31000 to make things easier and clearer. This is achieved by using a simple language to express the fundamentals of risk management in a way that is coherent and understandable to users.
ISO 31073 covers 49 terms and concepts that are categorized into the following groups:

- 3 terms relating to risk (risk, objective and uncertainty);
- 3 terms relating to risk management (risk management, risk management policy and risk management plan);
- 43 remaining terms relating to the risk management process.

ISO 31073:2022 on vocabulary for risk management is useful for:

- the owners of the organizations;
- risk assessment managers;
- management board members and advisors and
- those engaged in managing risks.

Therefore, the standard provides a basic vocabulary to develop a common understanding of risk management concepts and terms among organizations and functions, and across different applications and types.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Understanding QMS Principles: Students should grasp the foundational principles of QMS, including principles of quality, customer focus, leadership, process approach, and continual improvement. In an environmental context, this understanding would align with eco-centric quality principles.
- As part of risk management courses, students will learn about how to identify and investigate risks. This includes learning about risk assessment methodology, which examines and analyses different sources of risks. Students will also learn how to investigate the potential effects of the risks. Risk management training may often discuss processes that measure and predict the potential effects of risk.
- Students will also learn about how to communicate specific actions that they can take to help mitigate and manage risks. In addition, they may learn how to follow up with employees on their specific needs regarding risk management. This training may also discuss how to report on risks, including writing reports and participating in industry conferences or seminars.
- Additionally, students will learn about what risk assessment reports are and how to write them. For example, they may learn about how to conduct reasonable worst-case scenarios and conduct a risk analysis to evaluate the financial impact of risk and its potential for occurrence. Reports can also be comprehensive, discussing a wide range of potential risks for an organization.
- Thus, analytical thinking skills are also important for risk managers, as this role entails analysing business-related risks and determining possible ways to mitigate them. For example, risk managers may evaluate the likelihood that an organization may experience

a financial loss due to a hazard or situation. In this context, the students will achieve an analytical-based thinking.

Teaching board (OPTIONAL)
Prof. habil. Camelia TULCAN
Prof. Sorina POPESCU
DVM, PhD Student Roberta TRIPON

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered.The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 2 Description

Risk management guidelines

This training is developed to provide knowledge and some practical guidance on the implementation of the international standard on risk management ISO 31000:2018 *Risk management — Guidelines*. Other risk management standards are also taken into consideration when explaining ISO 31000.
The module explains the whole structure and content of the standard, incl. its scope; terms and definitions; risk management principles; framework and process. In addition, it offers additional explanations and useful insights on some of the key topics with the aim to provide the learner with better understanding of the standard and suggestions for further practical use.
After finalizing the module, the students and adult learners will have sufficient knowledge about:

- what risk management is;
- importance of risk management for the existence and sustained development of any organization;
- the fundamental concepts, principles and framework of risk management;
- the process of risk identification and management;

- how risk management could be integrated into the governance, decision-making and culture of the organization.

Learning outcomes

Students will also acquire some basic skills which will help them to start working in any organization or company that manages risk or have integrated risk management in its governance, following the recommendations of ISO 31000.

Teaching board (OPTIONAL)

Prof. habil. Camelia TULCAN
Prof. Sorina POPESCU
DVM, PhD Student Roberta TRIPON

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
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MODULE 3 Description

Risk assessment techniques

This module presents the International Standard ISO 31010:2019 "Risk management - Risk assessment techniques", which provides guidance on the selection and application of various techniques that can be used to help understand risk and uncertainty. The techniques are used within the risk assessment steps of identifying, analysing and evaluating risk as described in ISO 31000. The module is valuable and useful for tutors, organizations and individuals, aiming to enhance their risk assessment practices and can contribute to their skill development and expertise. It provides a structured framework, a variety of techniques, emphasizes the importance of involving stakeholders and communicating risks effectively,

and a systematic approach that supports better decision-making, risk communication, and overall risk management.

Learning outcomes

- As part of risk management courses, students will learn about how to identify and investigate risks. This includes learning about risk assessment methodology, which examines and analyses different sources of risks. Students will also learn how to investigate the potential effects of the risks. Risk management training may often discuss processes that measure and predict the potential effects of risk.
- Students will also learn about how to communicate specific actions that they can take to help mitigate and manage risks. In addition, they may learn how to follow up with employees on their specific needs regarding risk management. This training may also discuss how to report on risks, including writing reports and participating in industry conferences or seminars.
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Teaching board (OPTIONAL)
Prof. habil. Camelia TULCAN
Prof. Sorina POPESCU
DVM, PhD Student Roberta TRIPON

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered.The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher,

and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.

- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 4 Description

Risk management guidelines on using ISO 3100 in management systems

The International Workshop Agreement* IWA 31:2020 Risk management - Guidelines on using ISO 31000 in management systems is an ISO Agreement that provides guidelines for the integration and use of ISO 31000 in organizations that have implemented one or more management system standards or have decided to undertake a project implementing one or more ISO standards that incorporate ISO 31000. This training is developed to provide guidance for properly integrating the ISO 31000 standard (Risk Management – Guidelines) in organizations that have already implemented or are in the process of implementing one or more management systems, and it explains the connection to the high-level structure (HLS) of management systems standards.

Learning outcomes

- Understanding QMS Principles: Students should grasp the foundational principles of QMS, including principles of quality, customer focus, leadership, process approach, and continual improvement. In an environmental context, this understanding would align with eco-centric quality principles
- As part of risk management courses, students will learn about how to identify and investigate risks. This includes learning about risk assessment methodology, which examines and analyses different sources of risks. Students will also learn how to investigate the potential effects of the risks. Risk management training may often discuss processes that measure and predict the potential effects of risk.
- Students will also learn about how to communicate specific actions that they can take to help mitigate and manage risks. In addition, they may learn how to follow up with employees on their specific needs regarding risk management. This training may also discuss how to report on risks, including writing reports and participating in industry conferences or seminars.
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- Thus, analytical thinking skills are also important for risk managers, as this role entails analysing business-related risks and determining possible ways to mitigate them. For example, risk managers may evaluate the likelihood that an organization may experience a financial loss due to a hazard or situation. In this context, the students will achieve an analytical-based thinking.

Teaching board (OPTIONAL)
Prof. habil. Camelia TULCAN
Prof. Sorina POPESCU
DVM, PhD Student Roberta TRIPON

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
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MODULE 5 Description

Traceability in the feed and food chain

Traceability system means all data and operations able to maintain the desired information about a product and its components during a segment or the whole chain of food/feed production and use. The standard is applicable to document the history or identify the location of a product, or the relevant components, either inside an individual organization or in a coordinated food chain system in order to increase security and safety throughout the food chain and establishing an acceptable model for raw material supply, food production, marketing and consumption

Learning outcomes

- The participants will be able to understand and apply the requirements and criteria of ISO 22005:2007.
- Participants will develop a set of principles to assist organizations in utilizing traceability/product tracing as a tool within their food inspection and certification system.
- The participants will be able to implement a traceability system that can improve the appropriate use and reliability of information, effectiveness and productivity of any organization.

- The acquired knowledge will allow the participants to correctly use the integrated standards for different product groups, ranging from plant and livestock production to plant propagation materials and compound feed manufacturing.

Teaching board (OPTIONAL)
Prof. habil. Camelia TULCAN
Prof. Sorina POPESCU
DVM, PhD Student Roberta TRIPON

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS

Carbon Footprint

SYLLABUS

UNIVERSITY OF LIFE SCIENCES ``King Mihai I ` from Timisoara

Co-funded by the European Union

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Elaborated by	Life Sciences University ``King Michael I of Romania`` from Timisoara Faculty of Engineering and Applied Technologies
Work Package Nº and Title	**WP3**
Dissemination Level	International
Language	EN and Romanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	Carbon Footprint Assesment
Equivalent in ECTS	*4 ECTS*
Approved by:	University Senate
Date of approval:	22.09.2023
Duration in hours[1]	100
Teaching board	Title: Prof. Dr. — Name: Camen Dorin — e-mail: camendorin@yahoo.com

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with the basic concepts and concepts related to the circular economy and green business, Greenhouse gases,Carbon footprint of products,Requirements and guidelines for quantification, Adaptation to climate change, Guidelines on vulnerability, impacts and risk assessment,Net zero guidelines. introduced by the standards* EN ISO 14067:2018, EN ISO 14090:2019, EN ISO 14091:2021, EN ISO 22526-1:2021 and IWA 42:2022. *The specificity of this training course assumes that the participants are students (bachelor's or master's), professionals and external users with a technical profile and knowledge in areas such as impact to the climate change, impact of biobased plastics on the environment , carbon and environmental footprint of biobased plastic products, life cycle assessment.*
Level:	☒Undergraduate

[1] To be considered as learning hours.

	☒Graduate ☒Undergraduate and Graduate ☒Life-long learning ☒Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an educational backgroundin the engineering domain.*
Learning Objectives	The main objectives of the course are: - -To familiarize the students with the concepts of Greenhouse gases, Carbon footprint of products - To familiarize the students with the main concepts related to the Adaptation to climate change process. - To provide students with theoretical and practical knowledge of carbon and environmental footprint of biobased plastic products, specifies the general principles and the system boundaries and requirements for their operation according to the EN ISO 22526-1:2021 standard; - To acquaint students with the fundamental paradigms and concepts related Carbon footprint of products according to standard EN ISO 14067:2018 - To acquaint the students with the Adaptation to climate change according to standard EN ISO 14091:2021
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.
Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.

Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers three mandatory modules as follows: Module 1: Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification EN ISO 14067:2018 - Introduction to the standard - Scope of the standard - Terms and definitions - Fundamental concepts and principles Module 2: EN ISO 14090:2019—Adaptation to climate change - Principles, requirements and guidelines - Introduction to the standard - Scope of the standard - Terms and definitions - Fundamental concepts and principles Module 3: EN ISO 14091:2021Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment – About EN ISO 14091:2021 - Introduction to the standard - Scope of the standard - Terms and definitions - Fundamental concepts and principles Module 4: EN ISO 22526-1:2021 – Introduction to the standard – Scope of the standard

	– Normative references – Terms and definitions – General principles – Carbon and environmental footprint of biobased plastics Module 5: IWA 42:2022 - Net zero guidelines – About ISO IWA 42:2022 - Introduction to the standard - Scope of the standard - Terms and definitions - Fundamental concepts and principles

Structural unit type	**Total duration in hours:**	20
Mandatory Module 1		
Structural unit title	In-class activities duration:	12
Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification EN ISO 14067:2018	Out-of-class activities duration:	8
In-classlearning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	20
Mandatory Module 2		

Structural unit title	In-class activities duration:	12
EN ISO 14090:2019— Adaptation to climate change - Principles, requirements and guidelines	Out-of-class activities duration:	8
In-classlearning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	20
Mandatory Module 3		
Structural unit title	In-class activities duration:	12
EN ISO 14091:2021Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment – About EN ISO 14091:2021	Out-of-class activities duration:	8
In-classlearning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	20
Mandatory Module 4		

Structural unit title	In-class activities duration:	8
EN ISO 22526-1:2021	Out-of-class activities duration:	12
In-classlearning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	
Mandatory Module 5		
Structural unit title	In-class activities duration:	12
IWA 42:2022 - Net zero guidelines	Out-of-class activities duration:	8
In-classlearning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic.

Course modules description

MODULE 1 Description

Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification EN ISO 14067:2018

Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification EN ISO 14067:2018: This module focuses exclusively on the climate change impact category and specifies principles for calculating greenhouse gas (GHG) emissions across a product's life cycle, from raw material acquisition to end-of-life. It includes definitions of key terms, such as primary and secondary data, biogenic material, and concepts like life cycle assessment (LCA) and carbon offsetting. The module also outlines the requirements for CFP reporting, which ensures consistency, accuracy, and transparency in GHG measurement.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Explain the Purpose and Scope of ISO 14067:2018: Articulate the role and significance of ISO 14067:2018 in assessing and managing the carbon footprint of products across their life cycles.
- Define Key Terms Related to Climate Change and Carbon Footprint: correctly use and interpret terms such as “carbon footprint,” “greenhouse gases,” and “life cycle assessment” within the context of ISO 14067:2018.
- Quantify the Carbon Footprint of a Product: Apply the principles and guidelines of ISO 14067:2018 to calculate and quantify a product's carbon footprint, considering emissions from each phase of its life cycle.
- Analyze the Life Cycle Stages that Impact Carbon Emissions: Identify and assess the main stages in a product’s life cycle that contribute to its carbon footprint, and explain how these emissions can be measured and reduced.
- Implement ISO 14067:2018 Reporting Standards for Carbon Footprint: Demonstrate an understanding of the requirements for reporting and communicating carbon footprint results in a standardized and transparent way according to ISO 14067:2018 guidelines.
- Evaluate the Scope and Limitations of ISO 14067:2018: Recognize and explain the standard’s limitations, such as its focus on GHG emissions and exclusions of non-GHG impacts and carbon offsetting.

Teaching board (OPTIONAL)

Prof. Dr. Camen Dorin

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 2 Description

EN ISO 14090:2019—Adaptation to climate change - Principles, requirements and guidelines

Module 2 provides principles and guidelines for adapting to climate change. It emphasizes the need for organizations to assess climate impacts and integrate adaptation strategies across their operations. The standard outlines key principles such as flexibility, sustainability, and systems thinking, encouraging organizations to incorporate climate adaptation into their policies and procedures.

After finalizing the module, the students and adult learners will have sufficient knowledge about:

- Understand the core principles of climate adaptation, including flexibility, sustainability, and systems thinking, and how these principles support long-term resilience.
- Recognize the importance of assessing potential climate impacts on various aspects of an organization, such as infrastructure, supply chains, and operational processes.
- Apply knowledge of ISO 14090:2019 to develop and integrate adaptation strategies that address climate risks, helping organizations to proactively respond to climate-related challenges.
- Identify ways to embed climate adaptation measures into an organization's policies, procedures, and decision-making processes, ensuring climate resilience across all operational levels.
- Assess the effectiveness and sustainability of various adaptation strategies to ensure they contribute positively to organizational and environmental resilience over time.
- Emphasize the role of systematic and long-term planning in managing climate risks, ensuring that organizations maintain adaptive capacity in the face of evolving climate conditions.

Learning outcomes

Students will be able to understand and apply principles of climate adaptation to assess climate impacts, develop adaptation strategies, and integrate these into organizational policies to enhance resilience and sustainability.

Teaching board (OPTIONAL)

Prof. Dr. Camen Dorin

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 3 Description

EN ISO 14091:2021 Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment

Guidance on screening assessments and impact chains is provided by EN ISO 14091:2021, which applies to all organizations regardless of their size, type, or nature, and also covers risks resulting from a changing climate.

Learning outcomes

- Understand the Purpose and Scope of EN ISO 14091:2021: Explain the role of EN ISO 14091:2021 in providing guidelines for assessing vulnerability, impacts, and risks related to climate change across different types of organizations.
- Identify and Assess Climate Change Risks: Apply screening assessments to identify climate risks and evaluate their potential impacts on organizational operations, infrastructure, and resources.
- Analyze Impact Chains: Understand and use the concept of impact chains to trace the relationship between climate hazards, impacts, and organizational vulnerabilities.
- Integrate Climate Risk Assessments into Organizational Planning: Incorporate vulnerability, impact, and risk assessments into organizational planning and decision-making processes to build climate resilience.
- Evaluate and Prioritize Adaptation Actions: Assess the significance of identified climate risks and prioritize adaptation measures based on their potential impact and feasibility.

Teaching board (OPTIONAL)
Prof. Dr. Camen Dorin

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 4 Description

EN ISO 22526-1:2021

Module 4, based on EN ISO 22526-1:2021, focuses on understanding the environmental impact of biobased plastics throughout their life cycle. This standard provides guidelines for assessing the sustainability of biobased plastics, including the resources used for production, their biodegradability, and the potential for reducing carbon emissions compared to traditional plastics. The module aims to equip learners with strategies to minimize the carbon footprint of biobased plastics, including optimizing their production processes, improving recycling systems, and promoting sustainable alternatives. By the end of this module, learners will be able to evaluate the environmental implications of biobased plastics and adopt best practices for reducing their environmental footprint in various industries.

Learning outcomes

- Understand the Environmental Impact of Biobased Plastics: Explain the life cycle of biobased plastics and how they compare to traditional plastics in terms of environmental impact.
- Assess the Sustainability of Biobased Plastics: Evaluate the use of resources, biodegradability, and carbon emissions associated with biobased plastics production and disposal.
- Identify Strategies to Minimize the Carbon Footprint of Biobased Plastics: Develop and apply strategies to reduce the carbon footprint of biobased plastics, such as optimizing production processes and improving recycling methods.

- Promote Sustainable Alternatives to Conventional Plastics: Recognize and promote sustainable biobased plastic alternatives in various industries, contributing to the reduction of environmental impacts.
- Evaluate Best Practices for Biobased Plastic Implementation: Assess the effectiveness of different strategies and practices in minimizing the environmental impact of biobased plastics, ensuring sustainability in their use.

Teaching board (OPTIONAL)

Prof. Dr. Camen Dorin

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 5 Description

IWA 42:2022 - Net zero guidelines

IWA 42:2022 provides comprehensive guiding principles and recommendations to establish a unified, global approach for organizations striving to achieve net-zero greenhouse gas emissions by 2050, at the latest. The standard emphasizes the importance of addressing all sources of emissions within an organization’s value chain, both direct and indirect, including those from operations, supply chains, and product life cycles. It encourages organizations to take concrete, measurable actions to reduce their carbon footprint, set science-based targets, and adopt strategies that align with global climate goals. The guidance includes methodologies for assessing, managing, and reporting greenhouse gas emissions, ensuring transparency and accountability in the transition to net-zero. Through this framework, IWA 42:2022 aims to drive meaningful and systemic change across industries, helping organizations align with international climate commitments and contribute to the global effort to mitigate climate change.

Learning outcomes

- Understand the Principles of Achieving Net-Zero Emissions: Explain the guiding principles and global approach outlined in IWA 42:2022 to achieve net-zero greenhouse gas emissions by 2050.
- Identify and Address Direct and Indirect Emissions: Recognize the importance of addressing both direct and indirect greenhouse gas emissions within an organization's value chain and apply strategies to reduce them.
- Set Science-Based Targets for Emission Reductions: Develop science-based targets for greenhouse gas reductions in alignment with international climate goals and frameworks.
- Implement Action Plans for Emission Reduction: Design and implement action plans to reduce greenhouse gas emissions across all areas of an organization, including operations, supply chains, and product life cycles.
- Evaluate and Report Emissions Transparently: Assess and monitor emissions within the value chain and report progress transparently, ensuring compliance with IWA 42:2022 guidelines.
- Promote Systemic Change towards Sustainability: Advocate for and support systemic change in organizational practices, contributing to the global effort to mitigate climate change and achieve net-zero emissions..

Teaching board (OPTIONAL)

Prof. Dr. Camen Dorin

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

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- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

BOOSTING THE GREEN FUTURE
VIA UNIVERSITY MICRO-CREDENTIALS
Reference Number: 2022-1-BG01-KA220-HED-000085821

Biomass and Good Practices in the Management of Degraded and Desertified Lands

SYLLABUS

UNIVERSITY OF LIFE SCIENCES „KING MIHAI I" FROM TIMISOARA

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Elaborated by	Life Sciences University ``King Michael I of Romania`` from Timisoara **Faculty of Engineering and Applied Technology**
Work Package Nº and Title	WP3 - Development
Dissemination Level	International
Language	EN and Romanian

Section 1. GENERAL INFORMATION

Title of Micro-Credential:	**Biomass and Good Practices in the Management of Degraded and Desertified Lands**
Equivalent in ECTS	*4 ECTS*
Approved by:	University Senate
Date of approval:	22.09.2023
Duration in hours	100
Teaching board	Title Name e-mail Assoc. Prof. Maria Mihaela Moatar mihaela.moatar@usvt.ro Lecturer Petru Ioan Dragomir petruioandragomir@usvt.ro

Section 2. PROGRAM INFORMATION

Trainees profile:	*The course aims to familiarize students with basic concepts and terms such as land degradation, desertification, solid biofuel and green standards. A key emphasis of the course is concepts of good practices to combat land degradation and desertification in the context of the standards ISO 14055-1:2017, ISO/TR 14055-2:2022, EN ISO 17225- 1:2021, EN ISO 18135:2017, EN ISO 17828:2015.* *The specificity of this training course assumes that the course participants are students (bachelor's or master's degree), professionals and other external users with an economic profile.*

Level:	☐ Undergraduate ☐ Graduate ☒ Undergraduate and Graduate ☒ Life-long learning ☒ Professional development
Who is eligible:	☐ Only students from the University ☐ Only students out of this University ☒ Students from the University and non-university students ☒ External trainees
Instruction method:	☐ In person ☒ Online ☐ Hybrid
Pre-requisite (s)	*It requires the course participants to have an economic educational background.*
Learning Objectives	The main objectives of the course are: - To familiarize the students with the concepts of good practices to combat land degradation and desertification and solid biofuels of raw and processed materials originating from forestry, arboriculture, agriculture, horticulture, and aquaculture. - To familiarize the students with the main paradigms and concepts related to the standardization process. - To acquaint students with the definitions related to provide guidelines for developing good practices to combat land degradation and desertification according to standards 14055-1:2017, ISO/TR 14055-2:2022 - To acquaint learners with the general methods for assessing the, according to the methodology set by the European standard EN ISO 17225- 1:2021, EN ISO 18135:2017; - To acquaint students with the methods of determining bulk density of solid biofuels according to the EN ISO 17828:2015.; - To acquaint learners with the main parameters and methods for assessing the ability to repair, reuse and upgrade energy-related products according to the EN 45554:2020 standard.
Pedagogical methods	The presentation of the educational material is carried out by providing access to multimedia electronic lectures and presentations. The students observe educational video materials presenting relevant examples and demonstrations and work with educational literature - printed editions, electronic materials and publications, websites, etc. Students receive detailed instructions and complete exercise tasks, participate in online discussions.

Communication system	The training course is available to all registered participants through the e-learning platform. The main connection with the teaching staff will take place through the electronic communication channels regulated in the educational institution. During each week of the course, online discussions, and consultations with the teachers (of an optional nature) on the topics of the course with a total duration of 2 study hours per week are planned.
Evaluation methods	Each of the modules includes tasks for independent work. The performance of the assigned tasks is evaluated according to pre-set clear and precise criteria according to the six-point system.
Criteria for successful completion	Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Section 3. CONTENT STRUCTURE AND SCHEDULE OF ACTIVITIES

Content structure	The course is organized on a modular basis and covers two mandatory module. The compulsory modules of the course are: **Module 1:** Solid biofuels - Fuel specifications and classes - Introduction to the standards - Scope of the standards - Terms and definitions according to standard EN ISO 17225- 1:2021, - Fundamental concepts and principles **Module 2:** Solid biofuels, sampling plans - Introduction to the standards - Scope of the standards - Terms and definitions according to standard EN ISO 18135:2017 - Fundamental concepts and principles **Module 3:** Management of land degradation and good practices to combat land degradation and desertification - Introduction to the standards - Scope of the standards - Definitions related to material efficiency according to standards 14055-1:2017, - Fundamental concepts and principles - Standards and standardization – nature of standards, types of standards, standardization organizations, standardization process, standards and legislation. **Module 4:** Biomass as a solid biofuel, method of determining bulk density - Introduction to the standards - Scope of the standards - Terms and definitions according to standards EN ISO 17828:2015. - Fundamental concepts and principles - Methods of determining bulk density of solid biofuels according to the EN ISO 17828:2015; **Module 5:** Good practices to combat land degradation and desertification. Case studies Introduction to the standards - Scope of the standards - Terms and definitions according to standards ISO/TR 14055-2:2015. - Fundamental concepts and principles

Structural unit type	Total duration in hours:	50
Mandatory Module 1		
Structural unit title	In-class activities duration:	28
Solid biofuels - Fuel specifications and classes	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	Total duration in hours:	**50**
Mandatory Module 2		
Structural unit title	In-class activities duration:	28
Solid biofuels, sampling plans	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	

Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Structural unit type	**Total duration in hours:**	50
Mandatory Module 3		
Structural unit title	In-class activities duration:	28
Management of land degradation and good practices to combat land degradation and desertification	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	50
Mandatory Module 4		
Structural unit title	In-class activities duration:	28

Biomass as a solid biofuel, method of determining bulk density	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	
Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.	

Structural unit type	**Total duration in hours:**	50
Mandatory Module 5		
Structural unit title	In-class activities duration:	28
Good practices to combat land degradation and desertification. Case studies	Out-of-class activities duration:	22
In-class learning activities	Students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.	

Out-of-class assignments	Assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfil the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

Instructional Materials and References for the course	Electronic learning content - lectures and presentations. Illustrative examples and videos. Additional information resources – printed and electronic.

Tools and methods used for formative and summative assessment	Self-assessment tests are provided during the training within a given module. (diagnostic function) Students complete practical assignments with assessment. At the end of each module, students complete a test to verify and evaluate the knowledge acquired within the module. The final mark of the module is the average mark of the final test and the marks of the practical assignments included in the module. The final grade for the course is the arithmetic average of the final grades for the course modules.

Course modules description

MODULE 1 Description

Solid biofuels - Fuel specifications and classes

Solid Biofuels - Fuel Specifications and Classes: This module provides a detailed overview of the classification, quality standards, and trading principles for solid biofuels derived from organic materials, with a specific focus on those used in heat and power generation. It covers the various types of biofuels, including those produced from forestry, agricultural, and aquatic biomass materials, and explains how these materials are classified based on their physical and chemical properties. Emphasis is placed on understanding the quality standards that ensure these fuels are suitable for efficient and sustainable energy production. The module also explores the principles governing the trading and certification of solid biofuels, including the importance of sustainability criteria, regulatory compliance, and traceability in the bioenergy market. By the end of the module, learners will understand the key factors that influence the use and value of solid biofuels, including feedstock sourcing, processing methods, and international trading practices, ensuring they can navigate and contribute to the growing bioenergy sector effectively.

Learning outcomes

After studying this module, you will achieve the following learning outcomes:

- Describe the importance of standards, particularly EN ISO 17225-1:2021, in ensuring the quality, safety, and efficiency of solid biofuels for heat and power generation.
- Accurately interpret and use essential terms and definitions associated with solid biofuels as outlined in the standard, aiding in clear communication and compliance within the biofuels industry.
- Explain the specific scope of EN ISO 17225-1:2021, including the types of biofuels covered (such as wood, agricultural, and aquatic sources) and the context in which these standards apply.
- Recognize and apply key principles for classifying and evaluating biofuels based on origin, energy content, and physical properties, which are essential for quality control and trading purposes.
- Assess biofuels based on standardized quality metrics and grading principles, preparing you to implement best practices in quality assurance, regulatory compliance, and sustainable biofuel management.

Teaching board (OPTIONAL)

Lecturer Petru Ioan DRAGOMIR
Assoc. Prof. Maria Mihaela MOATAR

Criteria for successful completion of the module

Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

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- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 2 Description

Risk management guidelines

This module focuses on the importance of sampling plans for solid biofuels, as outlined in the EN ISO 18135:2017 standard. It provides an introduction to the relevant standards for biofuel sampling, their scope, and the key terms and definitions used in the industry. The module emphasizes the role of standardized sampling methods to ensure accurate representation and quality control of biofuels, from wood pellets to agricultural residues.

After finalizing the module, the students and adult learners will have sufficient knowledge about:

- Understand the key principles and standards related to solid biofuel sampling.
- Describe the scope and application of the EN ISO 18135:2017 standard in biofuel sampling.
- Recognize and define essential terms used in biofuel sampling according to the standard.
- Apply appropriate sampling techniques to ensure accurate quality assessments of biofuels.
- Understand the importance of proper sampling for biofuel trading and quality control.

Learning outcomes

Students will also acquire essential skills to work in any organization or company that manages biofuels, particularly those involved in the sampling and quality control of solid biofuels. By following the guidelines of the EN ISO 18135:2017 standard, they will learn how to implement proper sampling techniques and ensure accurate representation of biofuel quality for trading, compliance, and efficiency in biofuel management.

Teaching board (OPTIONAL)

Lecturer Petru Ioan DRAGOMIR
Assoc. Prof. Maria Mihaela MOATAR

Criteria for successful completion of the module

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arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 3 Description

Management of land degradation and good practices to combat land degradation and desertification

This module delves into the standard EN ISO 18135:2017, which provides detailed methods for sampling solid biofuels to ensure their quality and consistency in trading. It focuses on various sampling techniques, both manual and mechanical, used for different types of biofuels, ranging from wood pellets to straw bales. The module emphasizes the importance of accurate sampling methods to guarantee the integrity and quality of biofuels, which is essential for their proper classification, pricing, and trading in the global market. In addition to exploring these sampling techniques, the module highlights best practices for land management to combat land degradation and desertification, discussing sustainable land-use strategies and the role of biofuels in reducing environmental impacts. Learners will gain practical knowledge in both biofuel quality control and the broader context of land management, enabling them to contribute to sustainable land practices and the efficient production and use of solid biofuels in energy generation.

Learning outcomes

- Understand the Importance of EN ISO 18135:2017: Explain the significance of EN ISO 18135:2017 in ensuring the quality control of solid biofuels, particularly in the context of biofuel trading.
- Identify and Apply Sampling Techniques for Biofuels: Demonstrate knowledge of both manual and mechanical sampling methods for various biofuels, including wood pellets and straw bales, ensuring accurate representation of the biofuel's quality.
- Evaluate the Role of Sampling in Biofuel Quality Control: Assess the role of sampling in maintaining biofuel quality and consistency, and explain how these techniques contribute to the reliability of biofuel trade and certification.

- Understand the Connection Between Land Degradation and Biofuel Production: Analyze how land degradation and desertification impact biofuel production and how sustainable land management practices can mitigate these challenges.
- Apply Sustainable Land Management Practices: Identify and apply good practices for land management aimed at combating land degradation and desertification, contributing to more sustainable biofuel production.
- Integrate Biofuel Quality Control with Land Sustainability: Integrate biofuel quality control processes with sustainable land-use practices to promote the responsible production and trading of biofuels.

Teaching board (OPTIONAL)
Lecturer Petru Ioan DRAGOMIR
Assoc. Prof. Maria Mihaela MOATAR

Criteria for successful completion of the module
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Module Assessment

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MODULE 4 Description

Biomass as a solid biofuel, method of determining bulk density

Biomass as a solid biofuel, method of determining bulk density: EN ISO 17828:2015 standard, focusing on the determination of bulk density for pourable solid biofuels. Bulk density is crucial for evaluating fuel deliveries on a volume basis, calculating energy density, and planning storage and transport requirements. Applying methods using specific containers and understanding the factors affecting bulk density, such as

compaction during transport. The module covers sample preparation, calculation methods, and the impact of environmental conditions and handling solid biofuels.

Learning outcomes

- Understand the Importance of Bulk Density in Solid Biofuels: Explain the significance of bulk density for evaluating fuel deliveries, calculating energy density, and planning storage and transport requirements.
- Apply EN ISO 17828:2015 for Bulk Density Determination: Demonstrate how to apply the methods outlined in EN ISO 17828:2015 to determine the bulk density of pourable solid biofuels using specific containers.
- Identify Factors Affecting Bulk Density: Recognize and describe factors such as compaction during transport and environmental conditions that influence the bulk density of solid biofuels.
- Prepare Samples for Bulk Density Testing: Prepare solid biofuel samples for bulk density testing, ensuring that they are handled properly to obtain accurate and reliable results.
- Calculate Bulk Density and Energy Density: Use calculation methods to determine bulk density and energy density, applying them to evaluate biofuel quality and energy content.
- Understand the Impact of Environmental Conditions on Biofuel Density: Assess how changes in environmental conditions, such as moisture content and temperature, affect the bulk density and handling of solid biofuels..

Teaching board (OPTIONAL)

Lecturer Petru Ioan DRAGOMIR
Assoc. Prof. Maria Mihaela MOATAR

Criteria for successful completion of the module

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Module Assessment

- In-class learning activities: students review the module's lecture content, and the provided examples and video materials to familiarize themselves with (learn) the important concepts and definitions. Students participate in communication activities - individual contact with the teacher, and forum discussions. Students participate in activities to verify and evaluate the knowledge acquired within the course module.
- Out-of-class assignments: assimilative activities - students review recommended supplemental materials and resources indicated by the instructor. Students participate in activities to find and handle information needed to fulfill the practical tasks set by the teacher. Students complete verification and self-assessment tests. If necessary, they participate in individual online consultations with the teacher.

MODULE 5 Description

Good practices to combat land degradation and desertification. Case studies

This module explores ISO/TR 14055-2:2022, which provides valuable insights and real-world case studies focused on combating land degradation and desertification. The standard presents practical examples of strategies and interventions implemented across various regions to address both climate-driven and human-induced impacts on ecosystems, such as soil erosion, biodiversity loss, and reduced agricultural productivity. Through these case studies, the module highlights successful approaches to land restoration, sustainable land management, and the rehabilitation of degraded ecosystems. Learners will explore how these practices can be applied in different geographical, socio-economic, and environmental contexts. The module also emphasizes the importance of adaptive management, community involvement, and long-term planning to ensure the resilience of ecosystems and mitigate the impacts of land degradation. By examining these case studies, students will gain a deeper understanding of the challenges and solutions related to land degradation and desertification, enabling them to apply best practices in their own work or research related to environmental sustainability and land management.

Learning outcomes

- Identify Key Impacts of Land Degradation: Describe the main climate-driven and human-induced impacts on ecosystems, such as soil erosion, biodiversity loss, and reduced agricultural productivity.
- Analyze Real-World Case Studies on Land Restoration: Evaluate real-world examples of successful land restoration and sustainable management practices from various regions, identifying the key factors that contributed to their success.
- Apply Sustainable Land Management Practices: Recognize and recommend sustainable land management strategies that can mitigate land degradation and promote ecosystem resilience.
- Understand the Importance of Community Involvement and Long-Term Planning: Assess the role of community engagement, adaptive management, and long-term planning in creating sustainable solutions to land degradation and desertification.
- Adapt Best Practices to Diverse Contexts: Apply insights from case studies to develop context-specific approaches for combating land degradation in different geographical, socio-economic, and environmental settings.

Teaching board (OPTIONAL)
Lecturer Petru Ioan DRAGOMIR
Assoc. Prof. Maria Mihaela MOATAR

Criteria for successful completion of the module
Each of the course modules ends with test material on the relevant module. The assessment of the test is based on the six-point system. Two attempts are allowed for each test, with the higher score considered. The final grade is the arithmetic average of the grades from the independent assignments and the final tests for the modules in the course. The course is considered successfully completed when the average arithmetical score from all components for checking and evaluating the acquired knowledge and skills during the training is positive.

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