ENVIRONMENTAL COURSE MODULES & CONTENTS

AUTHORS

Joaquin Alonso, Alicia Fernández, Daniel Burgos
Universidad Internacional de la Rioja (UNIR)

Carine Herbin
Institut francais de la vigne et du vin (IFV)

Laura Rondoni, Fabio Maria Santucci
Centro per lo Sviluppo Agricolo e Rurale (CESAR)

Angelina Taneva-Veshoska, Ana Tomik
Institute for Research in Environment, Civil Engineering and Energy (IECE)

Trinidad Márquez, Julia Delgado
Federación Española del Vino (FEV)

Andreas Ziermann, Kerstin Fröhle
Lake Constanza Foundation (LCF)

DISCLAIMER

MORE INFO AND CONTACT

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Main Author (Partner)	IECE
Contact Person	Ana Tomic
Quality Reviewer	
Contributors	Alicia Fernandez, Joaquin Alonso - Universidad Internacional de la Rioja (UNIR)…
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LIST OF ABBREVIATIONS

CO - Confidential, only for members of the consortium

GP - General public

HE - Higher education

ICT – Information Communication Technologies

PP - Restricted to other programme participants

PU - Public

RC - Research community

RE - Restricted to a group specified by the consortium (including the Commission Services)

SMG- Strategic Management Group

EXECUTIVE SUMMARY

 'Environmental course modules & contents' is the second output of the Project Green Vineyards (Upskilling wineries staff: Responding to the challenges of climate change - 2021-1-ES01-KA220-VET-000033311), funded by the Erasmus+ Programme of the European Union. Green Vineyards is an action aimed at contributing to identifying the environmental competences required by wine sector workers to ensure a positive ecological footprint of the activities carried out in this primary sector industry.

This project result collects all the contents created by the project consortium to address the **competence framework** created as the first project result. The primary goal of this course content is to be the grassroots of the future learning experience that, with the help of a learning management system, will be made available to wine sector workforce.

This document collects the methodology and process followed to achieve the Green Vineyard course structure and content. Prerequisites, challenges, and goals are also described, arriving to the final course content.

The course is composed of 4 modules, which together comprise a total of **13 training units**. Every unit is divided in three levels of depth, together with many audiovisual resources (videos, podcast, etc), case-studies and self-assessment tests. The course content is available as an interactive version of this material on a learning management system, placed at **www.greenvineyards.eu .**

The content has been initially drawn up in **English**. However, it has been translated to five other languages, as **Spanish, French, German, Italian and Macedonian**.

INTRODUCTION

The EU is the world's leading producer of wine. It accounts for 45% of wine-growing areas, 65% of production, 57% of global consumption and 70% of exports. It substantially contributes to the agricultural sector, having a major impact in the rural environment and providing employment to millions of people in the EU. The wine sector has thus created value for local communities and guaranteed the subsistence of populations in vulnerable rural areas with little or no other economic alternative.

The EC European **Green Deal Communication** openly stated that tackling climate and environmental-related challenges are the defining task of this generation. The transforming of the EU economy for a sustainable future requires a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, **resource-efficient and competitive economy**.

However, an economy based on such sustainable initiatives cannot be achieved without a workforce to support it. It is important both to prepare the workforce for the skills requirements inherent in green jobs and to ensure that wine industries and workplaces do not face a shortage of adequately **skilled workers**. There is a breadth of skills needed to meet these ambitious objectives. Pro-active re-skilling and upskilling are therefore necessary to reap the benefits of the aforementioned ecological strategy.

That is why the project consortium has made a major effort to identify the **environmental competences** required by the wine sector workers to ensure a positive ecological footprint of the activities carried out in this primary sector industry. It has also served to identify common gaps in the workers' **knowledge, attitudes and skills**, to better address their training necessities.

This course is made up of 13 units, which addresses each of the identified competencies, enabling learners to face those challenges that most affect their daily lives.

Its layout facilitates access to training in six different languages, creating a friendly and accessible **online learning environment** for all kinds of wine sector staff, addressing one of the main challenges of rural society: the distance to training providers.

It will also raise awareness of climate change impact in this key sector, while improving the overall **climate literacy** of rural communities.

PRE-REQUISITES

Only one prerequisite was given: being digitally competent.

Digital competence involves the confident, critical, and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It is defined as a combination of knowledge, skills and attitudes (European Council 2018). See https://ec.europa.eu/jrc/en/digcomp .

CHALLENGES AND SOLUTIONS

Several matters were resolved while running the project. These aspects deserve attention as they exert an impact on the outcome.

The course was meant to be non-linear, allowing units to be taken in any order or perhaps not taken at all. This provides numerous ways to navigate the content, allowing students to tailor their learning experience to their specific requirements.

The course is designed for individual study, allowing participants to learn at their own pace. No teacher, coach, or learning buddy is required for its implementation.

The course is available in 5 languages: English, Spanish, French, German, Macedonian, and Italian.

The course is tailored to accommodate a wide range of target group in the wine sector encompassing workers, managers, owners and employees in the vineyard or agriculture sector. The difficulty lies in providing content that remains relevant to each group. In order to tackle this issue, the course is organized into three levels, allowing individuals within these target groups to explore the topic in greater depth. An alternative and successful strategy involves providing specific learning pathways customized to meet the individual requirements of different target groups.

The course content is also disseminated in an open format on the project website. Once the Moodle platform is launched, an interactive version of this material could be developed and openly distributed in the same webpage, including a careful selection of the external learning material.

Therefore, this course content should be seen as the foundation for a learning platform experience.

GOALS AND COMPETENCIES

The initial phase of the competence framework has been founded on actions such as desk research and individual contacts with several stakeholders that have allowed for the identification of several reference documents, such as the GreenComp: the European sustainability competence framework. Because of this internal task, the consortium partners have been able to select 15 initial competences, considered the most appropriate for the sector, that have the potential to be ultimately approved and incorporated into the final competence framework. These competences then had to be evaluated and validated by a group of stakeholders through an online questionnaire, wherein the individual responses were elaborated into a group average. In the questionnaire, there were also two open questions, in which respondents were invited to indicate their comments and suggestions about the 15 competences, as well as to provide suggestions about best practices in implementing green competences, if they had any.

The questionnaire has been translated into six different languages (English, French, German, Italian, Spanish, and Macedonian) to reach the largest number of relevant people in the sector in their own language, thus facilitating the understanding and fluency of the answers. 181 valid responses were obtained from 181 different stakeholders.

The 15 competences have been grouped into four different areas to form the Green Vineyards Competence Framework:

- Overall knowledge about climate change.
- Environmental management focused on climate change.
- Wine culture and society from a climate change perspective.
- GreenComp competences relevant to the sector.

Competence areas and competences were formulated at an earlier stage of the project, during the preliminary analysis. Main conclusion is a competence framework, which is presented in Figure 1.

The EC Council *Recommendation of 22nd May 2018 on key competences for lifelong learning* establishes the definition of competence as the combination of knowledge, skills, and attitudes, where:

a. **knowledge** is composed of the facts and figures, concepts, ideas, and theories which are already established and support the understanding of a certain area or subject.

b. **skills** are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results.

c. **attitudes** describe the disposition and mindsets to act or react to ideas, persons, or situations.

Therefore, all the competences included in the framework are described as aforementioned. Further information can be found at

GREEN COMPETENCES & SUSTAINABLE PRACTICES FOR WINE SECTOR

Green Vineyards Competence Framework

Overall knowledge about climate change

Climate change awareness

To understand the effects of climate change in the wine sector and viceversa, and to reflect on its impacts and potential consequences for future generations.

Climate change adaptation

To take action to prepare for and adjust to both the current effects of climate change and the predicted impacts in the future.

Environmental management focused on climate change

Water management

To make efficient use of the resource, by reducing the water footprint and protecting its quality.

Soil management

To support the proper use and management of agricultural soils and implement measures to protect soils, improve their fertility and contribute to the natural sequestration of CO_2.

Waste management

To understand that waste must be sustainably handled and disposed of.

Biodiversity

To have a broad understanding of agricultural ecosystems to protect them and build resilience to current and future threats.

Emissions reduction

To understand the impact of emissions, while implementing energy-efficient solutions to reduce the carbon footprint.

Energy efficiency

To have a broad understanding of energy sources and their impact.

Wine culture and society from a climate change perspective

Local & historical knowledge

To acknowledge the historical importance of wine culture and its benefits for the local environment, society, and the economy.

Sustainable production

To identify sustainable wine production practices and implement strategies to achieve it.

GreenComp competences relevant to the sector

Valuing sustainability

To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.

Systems thinking

To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.

Critical thinking

To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.

Problem framing

To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope.

Futures literacy

To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.

METHODOLOGY

The work undertaken in WP2 involved the creation of comprehensive course content on environmental competences that are essential for the wineries workforce and surrounding society, in order to ensure a positive ecological footprint of the activities carried out in the vine and farming sector.

This resource is designed to benefit not only vineyard field workers and farmers, but also technicians, administrative personnel and all those engaged in the wine production process. They will gain direct access to personalized training modules that are tailored to their specific needs, existing knowledge, skills, and aptitudes. By doing so, they will enhance their employability and be better prepared for emerging economic models.

Consequently, the course content is organized into individual units, which can be undertaken separately or as part of a structured learning pathway, through a Moodle platform. These units provide a complete and relevant set of training materials that explicitly address the acquisition of the identified competencies. Furthermore, the content will be made available in all partner languages, ensuring accessibility and inclusivity.

To define the learning objectives, Bloom's Taxonomy was employed as a framework. The learning objectives were established using Bloom's Taxonomy as a foundation. Bloom's Taxonomy is an educational framework that organizes and defines several stages of cognitive learning in a hierarchical manner. This tool assists teachers in developing clear and measurable learning goals by categorizing them into six tiers, spanning from the most basic cognitive processes to the most complex. The following levels are:

Knowledge: This level includes learning about information, facts, and concepts. At this level, the learning objectives usually focus on remembering and understanding key information.

Comprehension: Learners are expected to demonstrate an understanding of the material, which might include interpreting, summarizing, or explaining concepts.

Application: Learning objectives at this level require students to use the knowledge they've gained in practical, real-world situations, demonstrating the ability to apply what they've learned.

Analysis: At this level, learners are tasked with breaking down information into its constituent parts, identifying patterns, and making connections. It involves critical thinking and problem-solving.

Evaluation: The highest level involves assessing and making judgments about the quality or value of information, arguments, or solutions. Learners critically analyze and make decisions based on evidence and criteria.

Creation: Learners are expected to create something new by combining existing knowledge, ideas, or concepts. This level involves creativity and innovation.

By using Bloom's Taxonomy, learners can design learning objectives that encompass a broad range of cognitive skills, ensuring that learners engage with the material at various levels of complexity. This framework helps clarify what learners are expected to achieve and assess their progress effectively.

Source: https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/
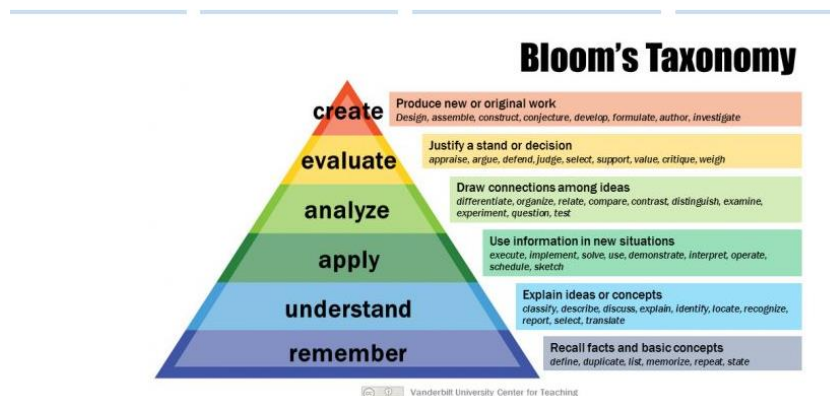
STRUCTURE

A two-layer structure was developed, consisting of modules and units of learning (UoL), to accommodate the previously determined modules and the requirement for additional fundamental and advanced knowledge.

In the following an overview of the modules, units and their duration is presented. Clicking on each unit will take you to the specific content section of the course.

N	Module	Unit	Duration
1	Overall knowledge about climate change	Climate change awareness	4 h
2		Climate change adaptation	4 h
3	Environmental management focused on climate change I	Climate-Adaptive Water	2.5 h
4		Soil management in Vineyards	2.5 h
5		Biodiversity and Agroecology	2 h
6	Environmental management focused on climate change II	Energy efficiency management	2 h
7		Emissions reduction	2.5 h
8		Management of waste	0.5 h
9	Wine culture and society from a climate change perspective	Local & historical knowledge	2 h
10		Sustainable production	2 h
11	Embracing sustainability and future trends in the wine sector	Valuing sustainability	1 h
12		Individual perspective on	2 h
13		Addressing modern challenges	3 h

COURSE STRUCTURE

All the 13 Units are composed of three levels, depending on their difficulty:

Level 1 (CORE) is the core learning (introductory texts + video lectures). All the learners will watch/read/study all the provided resources. This should take up, for the learners, about 1hr.

Level 2 (RELEVANT) includes external readings and activities, (about 2hrs, possibly more) by allowing learners to choose between multiple readings or task alternatives. Assignments that students need to complete in order to consider the module "completed" should be in this section.

Level 3 (OPTIONAL) is optional and includes additional resources in different languages as well as optional tasks and experiential activities that can be completed autonomously without teacher support/feedback.

Learners are encouraged to start studying the unit at its level 1, and depending on their interest, continue through levels 2 and 3.

Self-assessment is available at the end of every unit. It will only address level 1 topics, as to ensure a basic learning of the unit's core concepts.

LEARNING OBJECTIVES

The learning objectives are measurable statements that express what learners should know, be able to do, or value as a result of taking a unit or completing the whole course.

As a result of participating in every UNIT, learners:

Module	Learning objectives
Overall knowledge about climate change	• Identify main drivers of climate change in the wine industry. • Know how climate conditions and weather patterns affect grape growing and wine production. • Can identify areas for action to reduce the environmental impact. • Can name and list sustainable measures in the wine sector. • Can make informed decisions and take appropriate actions to minimise the negative impacts and maximise the positive impacts of climate change in the wine sector
Environmental management focused on climate change I	• Comprehend key EU strategies and techniques for climate-adaptive soil management, including soil fertility control, compaction prevention, erosion mitigation, contamination reduction, salinisation risk management, terroir protection, and CO_2 sequestration enhancement. • Understand the different impacts of sustainable water management practices in the context of winegrowing, focusing on agroclimatic mapping, hazard prevention, insurance, water consumption reduction, soil sealing limitation, and water quality preservation. • Examine the role of biodiversity in sustainable winery management, including the adoption of plant materials suited for agroecological challenges, reduction of chemical use, and implementation of biocontrol methods. • Compare case studies and real-world examples to develop comprehensive plans for soil, water, and biodiversity management in wineries, considering both short-term and long-term sustainability goals.

	• Reflect on personal values and their alignment with sustainability values in the wine sector, employing critical thinking skills to challenge conventional practices and propose innovative, environmentally conscious solutions.
Environmental management focused on climate change II	• Comprehend key strategy for reducing greenhouse gas reduction, including: reducing the carbon footprint and contribution to the natural sequestration of CO_2 by developing carbon sinks. • Understand the importance of an effective energy management, in the context of wineries and wine production, focusing on calculation of energy consumption, eco-design of buildings, and limitation of fossil energy, and energy consumptions. • List the techniques for managing waste, effluents, and by-products, including reducing waste and effluents and valuing by-products. • Identify in case studies and real-world examples how are applied plans for green houses gas, energy, and waste, effluents, and by-products in wineries, considering both short-term and long-term sustainability goals. • Reflect on personal values and their alignment with sustainability values in the wine sector, employing critical thinking skills to challenge conventional practices and propose innovative, environmentally conscious solutions.
Wine culture and society from a climate change perspective	• Understand the significance of local and historical knowledge of wine production, traditional techniques, historical grapevines, and viticultural landscapes. • Familiarise learners with the historical and cultural significance of wine culture and promote it through sustainable tourism. • Outline trading regulations, market trends, and consumer preferences • Identify sustainable traditional to reduce the environmental impact both in the field and in the winery. • Communicate their sustainability practices to consumers and stakeholders.
Embracing sustainability and future trends in the wine sector	• Assess information based on personal, social, and cultural backgrounds, applying critical thinking skills to challenge the status quo and propose alternative perspectives. • Demonstrate the following critical thinking skills: envisioning alternative sustainable futures, developing alternative scenarios, and identifying the steps needed to achieve a preferred sustainable future. • Understand the difference between short-, medium-and long-term approaches and their implications for sustainability scenarios.

	• Reflect on personal values and its alignment with sustainability values relevant to the wine sector.
	• Apply the framework of solving complex sustainability problems using the project-based learning methodology in proposing sustainable solutions to their work conditions.

SELF-ASSESSMENT

Each unit incorporates a final evaluation in the form of a multiple-choice quiz. This not only empowers learners to assess their understanding of the material but also serves as a validation of their acquired knowledge.

GUIDANCE FOR VET CENTRES TO USE THIS COURSE

As previously stated, this content is merely intended to feed the learning management system, which will be the result of the next project result and the main outcome of the project. In any case, this content is delivered as OER and, taking into consideration the CC-BY-NC-SA license, someone could use it or take parts of it. As an example, although Units are intended to be developed individually, a group of teachers could work in any of them collaboratively, both face to face or online, to have a common understanding, discussion or designing a learning experience for students.