

Educator's Guide to SMART Microlearning Innovative Pedagogies

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contents

Aligned with the project's guiding principles, the Smart Skills curriculum emphasises robust instructional methodology and clear structure.

This Guide serves as a strategic roadmap for educators, designed to enhance learning outcomes, maintain instructional coherence, and ensure a high standard of quality across all training sessions

01 Introduction

02 Overall Training Methodology

03 User Group

04 Modules Outline



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SUMMARY

Chapter 1

introduces the purpose and scope of the document.



Chapter 2

explains the training methodology, structure, module topics, and learning specifications.

Chapter 3

describes the target groups, selection criteria, and learner characteristics.



Chapter 4

outlines the course materials and documentation used during the training.



INTRODUCTION

01

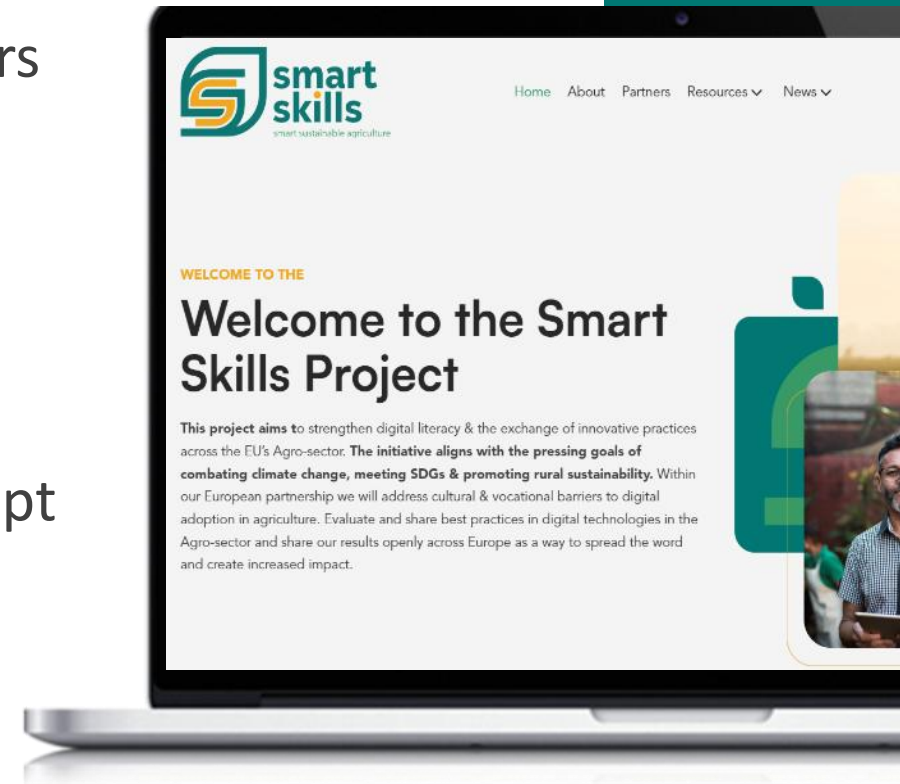


ABOUT THE PROJECT

The **Smart Skills** project is a European initiative dedicated to modernising the agro-sector by bridging the digital literacy gap. Our mission is to empower rural farmers, smallholders, and educators with the tools needed to adopt smart, sustainable, and climate-conscious agricultural practices.

The Challenge

Rural communities across the EU face significant barriers to digital adoption, including knowledge gaps, labour shortages, and the urgent need to adapt to climate change. Smart Skills addresses these hurdles by transforming complex technological concepts into accessible, practical knowledge.

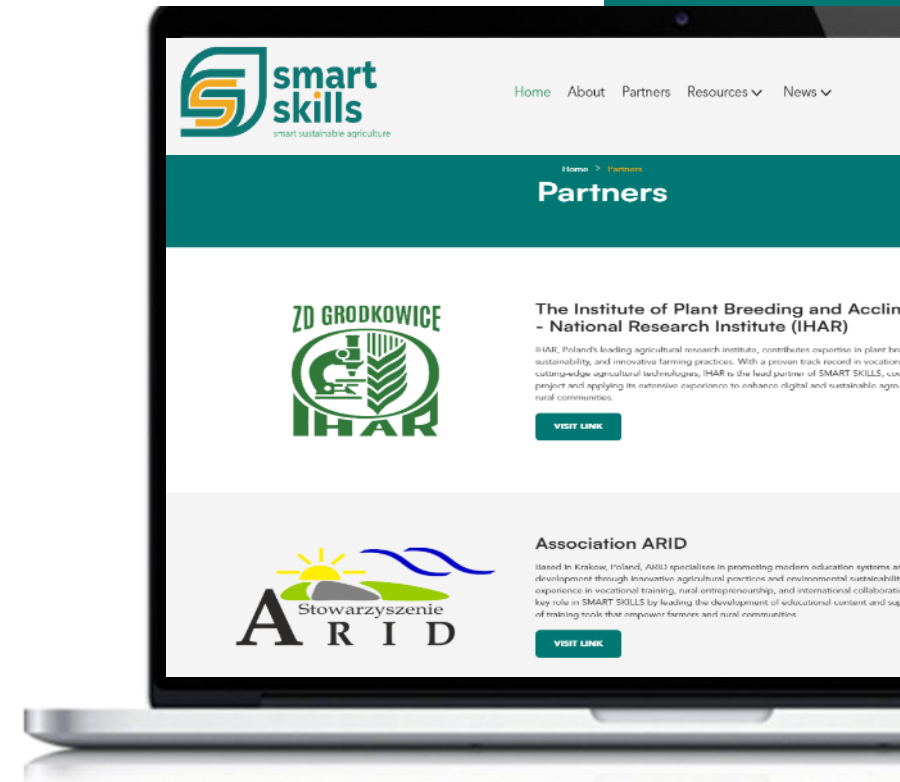


THE SMART SKILLS TEAM

A Multidisciplinary European Consortium

The Smart Skills training suite was co-created by a strategic alliance of European innovators, research institutions, and agricultural specialists. By combining digital pedagogy with deep-seated industry expertise, our team ensures that every resource is grounded in academic rigour and designed to translate directly into real-world success for rural practitioners.

To learn more about the Team, click [here](#)



ABOUT THIS GUIDE

As a vital component of the **SMART SKILLS Digital Learning Platform**, this guide serves as the strategic bridge between our digital resources and effective classroom or field-based delivery. While the platform provides the content, this document provides the **methodology**.

This Guide supports VET trainers, educators, and rural development specialists by:

- **Simplifying Implementation:** Providing a clear roadmap to integrate modules into existing vocational curricula.
- **Enhancing Pedagogy:** Offering micro-learning techniques tailored for adult learners in rural contexts.
- **Ensuring Consistency:** Maintaining high training standards across diverse European educational settings.
- **Empowering Facilitators:** Equipping trainers to lead digital transformation and overcome local barriers to technology adoption.

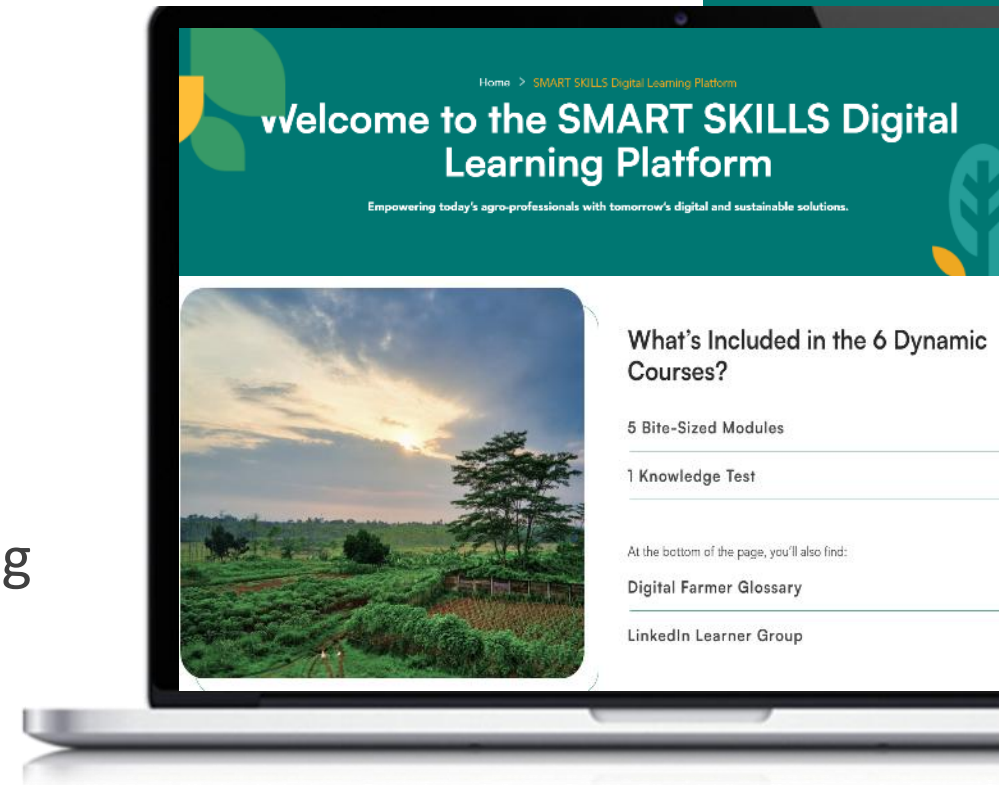


ABOUT THE CURRICULUM

The Smart Skills curriculum includes essential aspects related to:

- **Learning objectives**
- **Teaching materials/tools**
- **Competences**
- **Progress assessment**

The curriculum has been designed to provide educators with a clear framework for delivering training in a structured, practical, and learner-focused way.



KEY FEATURES OF THE SMART SKILLS OERS

Bearing in mind the principles of continuing vocational education and training, the main features of the Smart Skills Open Educational Resources (OERs) are:

- informal format
- easy and open access
- simple implementation
- integration between courses
- targeted materials
- adaptation to students and individual learners
- ongoing guidance and support
- relevant learning materials

The Smart Skills OERs' content and tools are tailored to the participants' **skills, learning experience, and working conditions.**

OVERALL TRAINING METHODOLOGY

02



THE OBJECTIVES OF THE TRAINING

The main objective of the Smart Skills project is to **strengthen digital skills and promote the exchange of innovative practices within the EU agricultural sector**. The initiative is aligned with key European priorities, including climate action, the Sustainable Development Goals (SDGs), and sustainable rural development.

Our Smart Skills courses are designed to bridge the divide between traditional education and modern agricultural needs. By identifying critical industry gaps through rigorous research, we have developed a curriculum that provides participants with the precise knowledge and skills required to thrive in today's evolving landscape.

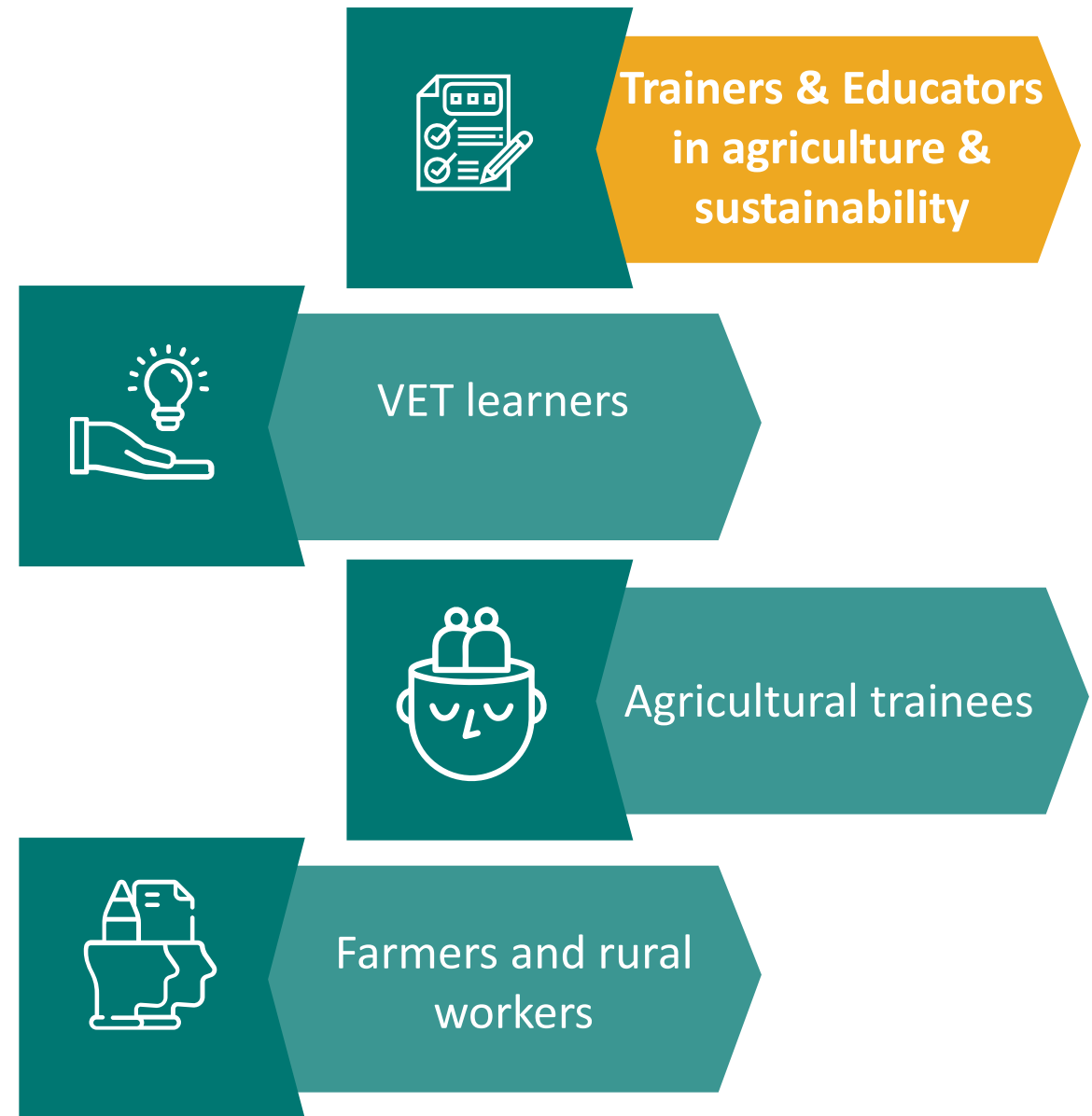
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WHO DELIVERS THE TRAINING AND WHO IT IS FOR

Focusing on modern tools and smart agricultural practices, the Smart Skills Training materials are designed to make knowledge transfer and skill-building as effective as possible. These Open Educational Resources are specifically tailored for **VET trainers working with rural farmers and smallholders**. Because the content has been rigorously tested and reviewed across Europe, educators can confidently adapt these high-quality materials to fit their specific classroom or field-based settings

Ultimately, the goal is to empower learners to adopt the smart technologies and sustainable practices vital to modern rural development.



METHODOLOGICAL APPROACH

Composed of six courses and thirty modules. The Smart Skills curriculum provides an academically grounded yet highly practical entry point into smart agriculture. Our methodology is built around the lived experience of rural workers, transforming challenges into opportunities through a progressive learning model. Each course is designed to build competence incrementally, ensuring that every theoretical concept is reinforced by its real-world application





METHODOLOGICAL APPROACH

The curriculum supports:

- digital skills development
- innovation in agricultural practice
- resilience in rural communities
- sustainable and climate-aware farming
- future-oriented vocational education

In line with the European Green Deal and broader climate goals, the programme highlights environmental responsibility, adaptation to climate change, and sustainable rural transformation.

The Smart Skills materials are most effective when they are actively integrated into the educator's own teaching context and connected to learners' real situations and needs.

GENERAL INSTRUCTIONS FOR EDUCATORS & TRAINERS

Before delivering the training, educators and trainers should carefully review this guide and the [course materials](#).

For classroom, flipped, or blended delivery, the following steps are recommended:

Download...

...review, and adapt course resources as needed

Allow...

...sufficient time for each training session

Localise...

...the content with relevant case studies & local examples

Ensure...

...that learners complete the exercises included in each module

Include...

...time for review, discussion, and feedback



INSTRUCTIONAL DESIGN PRINCIPLES

The Open Educational Resources are designed to accommodate different teaching styles, educational cultures, and learner profiles. Across all modules, a common instructional structure is followed:

- **Each topic is introduced clearly and briefly**
- **Content moves from general definitions to practical applications**
- **Current best practices are presented in an accessible way**
- **Knowledge is reinforced through exercises, questions, and activities**
- **Learners are encouraged to apply content rather than only read it**

This structure supports progressive understanding and helps learners build practical confidence alongside theoretical knowledge.



TEACHING AND LEARNING METHODS

The Smart Skills courses are based on a structured methodological framework and can incorporate a wide range of teaching and learning methods, depending on the target group and learning environment.

Recommended methods include:

- **Design-based learning** – learners work on real problems and produce a practical outcome
- **Problem-based learning (PBL)** – learners solve specific problems step-by-step
- **Workshops** – practical activities, collaboration, and discussion
- **Scenario-based learning / simulation** – role-play and situational problem-solving

TEACHING AND LEARNING METHODS

Recommended methods continued:

- **Brainstorming** – idea generation and creative thinking
- **Flipped classroom** – preparation at home, application in class
- **Gamification** – learning through points, levels, competition, and challenges
- **Oxford debate** – argumentation and critical thinking
- **Concept mapping** – visual organisation of knowledge
- **Small group work** – teamwork on projects, tasks, and exercises

Some courses also include digital and social media-based activities such as educational short videos, informative posts, mini-interviews, online campaigns, quizzes, and content analysis





TEACHING TIME & MICROLEARNING LOGIC

Accurate time planning is an important element of course design. When developing or delivering training, educators should take into account the time required not only for presenting content, but also for active learning, practical application, and task completion.

The **microlearning structure** of Smart Skills is a core strength in this regard, providing a flexible framework that accommodates individual learning speeds and varies easily between self-study and blended instruction.

Microlearning makes it easier to adapt training to:

- different learner abilities
- prior knowledge levels
- professional schedules
- personal motivation and learning pace



DELIVERY MODELS

The Smart Skills content can be delivered through several formats, depending on institutional needs, learner characteristics, and available resources.

1. Traditional Classroom Learning

Face-to-face teaching remains one of the most effective ways of building skills. In this setting, PowerPoint presentations, videos, whiteboards, and interactive activities can be used to support learning. Recommended delivery mechanisms include:

- small group discussions
- Q&A sessions
- multimedia content
- interactive tools such as Kahoot

Note: All the Smart Skills Micro Modules are available in PowerPoint format, allowing easy integration into existing curricula or direct roll-out.



DELIVERY MODELS

2. Online Learning

The Smart Skills digital learning platform offers flexible, accessible and multi-lingual online learning. The Smart Skills courses are available as an online programme, offering direct access for all stakeholders — including VET educators, trainers, farmers, rural workers & students. It includes:

- 6 courses and 30 modules
- downloadable PowerPoint presentations
- practical exercises & self-assessment quizzes
- additional multimedia and reading resources
- a comprehensive learner's glossary
- A learner's forum /LinkedIn group



DELIVERY MODELS

3. Blended Learning

Blended learning combines in-person teaching with digital content and communication tools. It can include:

- **Self-Guided Learning:** A highly flexible, independent mode where learners access multimedia materials anytime and anywhere. It offers total freedom of schedule—making it ideal for those with accessibility barriers—but requires high self-discipline to ensure success without direct trainer intervention.
- **Synchronous Learning:** Real-time instruction conducted via live chat or video conferencing. This mode prioritises immediate feedback and strong teacher-student relationships; however, it requires all participants to be online simultaneously with a stable internet connection.
- **Stationary (In-Person) Classes:** Traditional classroom-based training featuring full verbal and non-verbal interaction. This format allows for direct educator supervision and social group integration, though it is limited by travel costs, specific scheduling, and the need for a physical venue.
- **Asynchronous Learning:** Communication occurs with a time lag, where trainers assign tasks and provide delayed feedback. This pressure-free approach gives students ample time to reflect and analyze, though the lack of instant responses can occasionally slow momentum or demotivate learners.



DELIVERY MODELS

4. Flipped Classroom

In a Flipped Classroom, learners study module content before the class with a focus on exercises and assignments in class. The classroom transfer of knowledge makes way for online instruction outside the classroom. This creates more room for practicing in class, for extra explanation when needed, and offers the possibility to dive deeper into the materials during class time.

5. Collaborative / Peer-to-Peer Learning

Collaborative learning involves groups working together to achieve shared goals. Key methods for boosting peer-to-peer engagement include:

- **Peer Review:** Learners of similar competence evaluate each other's work, sharing experience and know-how while assessing performance.
- **Google Docs:** This tool enables real-time, remote collaboration on a single document. It tracks revision history, allows simultaneous editing, and facilitates learning through integrated chat and commenting features.



EQF AND ASSESSMENT APPROACH

The Smart Skills courses are aligned with the **European Qualifications Framework (EQF)**, which supports the comparison of qualifications across European education systems. The EQF describes learning outcomes in terms of:

- **knowledge**
- **skills**
- **competences**

Assessment in Smart Skills can combine both traditional and innovative methods.

Traditional assessment methods

- written exams
- homework or take-home assignments



EQF AND ASSESSMENT APPROACH

Innovative assessment methods

- student portfolios
- individual development goals
- interactive digital assessment tools
- peer assessment
- formative assessment
- self-assessment and reflection

The purpose of assessment is not only to measure knowledge, but also to support learner progress, autonomy, and practical development.



SCOPE OF THE SMART SKILLS COURSES

The topics of the Smart Skills courses were developed upon a foundation of rigorous literature analysis, partner expertise, and the strategic project framework. The programme consists of six courses:

1. **Digital Farming and Precision Agriculture**
2. **Smart Irrigation and Fertilisation**
3. **Mechatronics in Agriculture**
4. **Renewable Energy Integration in Agriculture**
5. **Climate-Smart Agriculture Techniques**
6. **Bringing Innovation to Farms**

Combined, these modules equip learners with a robust toolkit for technology-supported agriculture. The programme moves beyond theory to address the critical pillars of modern farming—**innovation, sustainability, and efficiency**—ensuring that rural practitioners are fully prepared to implement smart solutions in their local contexts.

SCOPE OF THE SMART SKILLS COURSES

#	Course	Modules	Partner
1.	Digital Farming and Precision Agriculture	<ol style="list-style-type: none"> IoT in Use Precision Agriculture IoT devices, sensors, actuators, converters Database and IoT Visualization and data analysis, IoT & GIS Advanced Tools in Precision Agriculture 	CZU
2.	Smart Irrigation and Fertilization	<ol style="list-style-type: none"> Fundamentals of Smart Irrigation Implementing IoT for Smart Irrigation Sustainable Fertilization Practices Integrated Irrigation and Fertilization Systems Renewable Energy-Powered Irrigation Systems 	IHAR
3.	Mechatronics in Agriculture	<ol style="list-style-type: none"> Mechatronics in Agriculture Agriculture Robots Sensors and Actuators Maintenance and Troubleshooting Future trends 	NEW EDU
4.	Renewable Energy Integration in Agriculture	<ol style="list-style-type: none"> Fundamentals of Renewable Energy in Agriculture Solar – Powered Solutions for Farms Wind and Biomass Energy Applications Renewable Energy in Greenhouses and Controlled Environments Government Policies and Incentives for Renewable Energy Adoption 	ARID
5.	Climate-Smart Agriculture Techniques	<ol style="list-style-type: none"> Introduction to Climate-Smart Agriculture Adapting Crop Production to Climate Variability Soil Conservation and Carbon Sequestration Water Resource Management under Changing Climates Reducing Emissions in Livestock and Crop Systems 	MERIDAUNIA
6.	Bringing to Innovation to Farms	<ol style="list-style-type: none"> Introduction to Control Systems Greenhouse Automation Livestock Monitoring Systems Field Automation & Real-Time Monitoring Integrating Smart Systems for Whole-Farm Management 	MOMENTUM



EXPECTED LEARNING OUTCOMES

The training structure has been designed to achieve clear and practical learning outcomes. By completing the programme, learners are expected to gain:

- an understanding of digital and precision farming
- stronger knowledge of smart irrigation and fertilisation systems
- insight into renewable energy applications in agriculture
- the ability to identify climate-friendly agricultural techniques
- improved digital competences
- a stronger capacity to implement innovation in agricultural practice

The programme is intended for VET students, VET organisations, farmers, agricultural development agencies and individuals involved in agricultural production.

STRUCTURE OF THE TRAINING CONTENT

The Smart Skills training content is presented in an interactive format. Each micro-module is supported by additional resources designed to make learning more engaging and practical.

The training content includes:

- links to video materials
- a “**Let’s Practice**” section with exercises and discussion prompts
- interactive online quizzes
- an interactive alphabetical glossary of key terms

The materials are intentionally designed to be visually attractive, educational, user-friendly, and relevant to the needs identified in prior research.





METHODOLOGICAL VALUE OF THE PROGRAMME

From a methodological perspective, Smart Skills offers a structured and flexible framework for modern vocational education in agriculture. Its value lies in the combination of:

- Research-based design
- Practical relevance
- Micro-modular structure
- Flexibility in delivery
- Support for active and learner-centred methods
- Alignment with sustainability and innovation goals

This makes the programme suitable not only as training content, but also as a methodological support tool for educators and trainers working in agricultural education.

03

USER GROUP



ADAPTING THE OERS TO LEARNER NEEDS

The effective use of the Smart Skills Open Educational Resources depends largely on how well they are adapted to the **needs, expectations, and backgrounds of learners**. The materials are not intended as a one-size-fits-all solution, but as a flexible educational resource that can be adjusted to different learning contexts.

The Smart Skills project aims to reach a broad and diverse audience at multiple levels. By doing so, it seeks to increase knowledge, strengthen competencies, and support the wider adoption of smart and sustainable practices in agriculture and rural development.

When selecting and working with target groups, it is important to consider:

- their level of prior knowledge
- their role in education or agricultural practice
- their learning needs and expectations
- their professional context and responsibilities

TARGET GROUPS AT THE LOCAL LEVEL

At the local level, the Smart Skills OERs are designed for groups directly involved in education, agricultural practice, and local development. These audiences are often the most immediate users of the training materials and the most directly affected by agricultural innovation and sustainability challenges.

These groups play an important role in applying knowledge in practice, supporting local innovation, and creating links between education and the real needs of rural communities.



TARGET GROUPS AT THE LOCAL LEVEL

The local target groups include:

- farmers involved in plant and animal production
- students of agricultural and vocational schools
- vocational education and training organisations
- agricultural advisors
- regional administration
- local governments
- companies in the agri-food sector
- the learning community, including teachers and students
- youth associations
- adult training and education organisations

TARGET GROUPS AT THE NATIONAL LEVEL

At the national level, the Smart Skills OERs are relevant to institutions and organisations that influence policy, educational systems, economic development, and broader support structures for vocational training and innovation.

These stakeholders are essential for the wider dissemination, institutional support, and strategic integration of the Smart Skills approach within national systems.



TARGET GROUPS AT THE NATIONAL LEVEL

The national target groups include:

- umbrella organisations for vocational education and training and entrepreneurship
- enterprise agencies and economic development bodies
- Chambers of Commerce
- social inclusion bodies
- development agencies
- educational and advisory institutions
- national policy makers and accreditation bodies
- private sector organisations, including NGOs involved in innovation and education



TARGET GROUPS AT THE EUROPEAN LEVEL

At the European level, the Smart Skills project addresses umbrella organisations connected with vocational education, training, and entrepreneurship. These organisations are important for sharing knowledge, promoting cooperation, and transferring good practice across countries and regions.



TARGET GROUPS AT THE EUROPEAN LEVEL

The European-level target groups include:

- VET umbrella organisations
- entrepreneurship-related umbrella organisations

Their involvement helps support the international relevance of the project and strengthens the potential for long-term impact across the European educational and agricultural landscape.

WHY THIS MULTI-LEVEL TARGETING MATTERS

The Smart Skills project is built on the understanding that meaningful change in agricultural education and practice requires engagement at multiple levels. Reaching only one type of learner or institution would limit the impact of the training.

By addressing local, national, and European target groups, the project:

- **broadens access to knowledge and resources**
- **supports cooperation between education and practice**
- **strengthens the dissemination of innovation**
- **encourages institutional and policy support**
- **increases the long-term sustainability of training outcomes**

This multi-level approach makes the OERs more relevant, scalable, and effective in supporting smart and sustainable agriculture across different contexts.

COURSE OUTLINES

04



WHAT THE COURSES CONTAIN AND HOW THEY CAN BE USED IN EDUCATION

Each of the six Smart Skills training courses is described through a **Course Curriculum**, which provides a structured overview of the course content, objectives, methods, and assessment. This format clearly defines what participants are expected to learn and what knowledge, skills, and competencies they should acquire by the end of the course.

Using a course curriculum in this way makes the training:

- clear and logically structured
- consistent across modules and topics
- easier for educators to apply in practice
- adaptable to different teaching settings
- suitable for both formal and non-formal learning contexts

The curriculum, therefore, serves as a content guide as well as a practical planning and implementation tool for educators and trainers.

EDUCATIONAL USE OF THE COURSE CURRICULUM

The course curricula can support the educational process in several practical ways.

1. Lesson Planning

The curriculum provides educators with a clear “map” of the course. It helps them:

- understand the logic and sequence of topics
- distribute the content over time, for example, across a semester or school year
- identify which topics are essential and which can be shortened
- prepare lesson plans, schedules, and teaching sequences more efficiently

EDUCATIONAL USE OF THE COURSE CURRICULUM

2. Managing Learning Objectives

Clearly formulated course objectives help educators:

- match teaching methods to intended outcomes
- select suitable learning resources
- adapt the difficulty level to the class
- monitor expected results in terms of knowledge, skills, and competences

3. Efficiency and Time Saving

Ready-made open access resources allow for a quick selection of the most important/relevant information to incorporate into your teaching materials.

4. Flexible Adaptation

The courses are designed to be flexible. Educators can:

- change the order of topics
- combine the content with other subjects
- add their own activities, examples, or local case studies

COURSE 1:

DIGITAL FARMING AND PRECISION AGRICULTURE

This course introduces learners to the use of advanced digital technologies in sustainable and efficient agricultural practice. Its main focus is on data-driven farming, real-time monitoring, automation, and spatial decision-making.

Methodological features

The course uses thematic microlearning slides, case studies, glossaries, infographics, discussion prompts, and problem-based tasks. It is suitable for self-paced e-learning, blended learning, digital delivery, and VET workshops.



Course 1 - Curriculum

Course No.1	Course title: Digital Farming and Precision Agriculture
Course content	
The main aim of the course	Students gain hands-on insights into sensor-based data collection, automated control systems (SCADA and PLC), cloud-based decision support, spatial analysis using GIS, and the transformative role of precision agriculture technologies like drones and smart sensors in improving yield and minimizing environmental impact.
Topic/Subject	<ol style="list-style-type: none"> IoT in Use in Precision Agriculture IoT devices, sensors, actuators, converters Database and IoT Visualisation and data analysis, IoT & GIS Advanced Tools in Precision Agriculture
Learning	
Detailed course objective	The course Digital Farming and Precision Agriculture aims to equip learners with the knowledge and practical skills necessary to harness advanced digital technologies for sustainable and efficient agricultural practices. Through five comprehensive modules, students will explore the integration of the Internet of Things (IoT), Geographic Information Systems (GIS), and cloud computing to enable real-time data collection, spatial analysis, and remote decision-making in various farming contexts. The course delves into the design and function of automated control systems—including sensors, actuators, SCADA, and PLC systems—and their role in optimizing agricultural operations such as irrigation and crop monitoring. Learners will also gain proficiency in using GIS tools to interpret IoT data spatially, assess the effectiveness of GIS-based solutions, and understand how spatial context influences agricultural decision-making. Finally, the course introduces the principles and technologies behind precision agriculture, including the application of smart sensors, drones, satellite imagery, and AI-powered analytics, all aimed at maximizing productivity, improving resource efficiency, and reducing environmental impact.
Knowledge	<ul style="list-style-type: none"> Understand how IoT technologies collect real-time data from fields, greenhouses, and animals to optimize processes such as irrigation, fertilization, and animal welfare. Gain in-depth knowledge of automated control systems, including sensors, actuators, and controllers. Understand cloud infrastructure models (IaaS, PaaS, SaaS) and their application in agriculture for scalable and real-time data access. Learn how to work with GIS tools to visualize and interpret agricultural IoT data. Understand vector and raster data, spatial analysis, mapping layers, and the creation of decision zones for field optimization Explore the use of AI, drones, multispectral imaging, and machine learning in precision agriculture for tasks such as disease detection, yield estimation, and resource optimization.
Abilities	<ul style="list-style-type: none"> To operate IoT devices to monitor environmental and crop parameters. To integrate IoT devices with cloud systems and dashboards for remote monitoring and process optimization To create and deploy basic cloud-based data storage and visualization platforms using tools such as InfluxDB, MongoDB, and Grafana. To use GIS software (e.g., QGIS, ArcGIS) to generate maps for precision sowing, fertilization, and crop zoning. To interpret AI-generated insights from multispectral and hyperspectral imaging to support sustainable, site-specific crop and livestock management

Competence	
Training and assessment standard	
Planned educational activities and teaching methods	<ul style="list-style-type: none"> • Thematic microlearning slides with visuals and examples • Use of real-world case studies to illustrate technology application • Glossary and infographics for better comprehension of technical terms • Discussion prompts and problem-based learning activities • Scenario-based thinking (e.g. farm problem – suitable automation solution)
Method of transmission	<ul style="list-style-type: none"> • Self-paced e-learning • Blended learning (online + classroom) • Can be delivered via digital platforms or during VET workshops • Suitable for integration into existing agricultural training programs
Teaching hours	<p>Estimated 8–10 total hours</p> <p>Each module: approx. 1.5–2 hours, including activities and short quiz</p>
EQF level	EQF Level 4–5
Assessment methods	<p>Self-assessment quiz at the end of the course</p> <p>Optional reflection assignments or open-ended questions</p> <p>Practical task suggestion (e.g., identifying automation needs on a learner’s farm or training plan)</p> <p>Trainer-led debrief (in blended delivery)</p>
Recommended or required reading	<p>Anagnostopoulos, T., Zaslavsky, A., & Kolomvatsos, K. (2021). <i>Real-Time IoT Sensor Data Aggregation for Smart Farming Decision Support</i>. <i>Future Internet</i>, 13(6), 149.</p> <p>Farooq, M.S., Riaz, S., Abid, A., Umer, T., & Zikria, Y.B. (2020). <i>Role of IoT Technology in Agriculture: A Systematic Literature Review</i>. <i>Electronics</i>, 9(2), 319. https://doi.org/10.3390/electronics9020319</p> <p>Gonzalez-de-Soto, M., Emmi, L., Perez-Ruiz, M., & Agüera, J. (2020). <i>Drones and Aerial Imaging for Precision Crop Management</i>. <i>Agricultural Engineering International: CIGR Journal</i>, 22(1), 53–62.</p> <p>Microsoft. (2020). <i>FarmBeats: AI, Edge & IoT for Agriculture</i>. Microsoft Research Whitepaper. Retrieved from https://www.microsoft.com/en-us/research/project/farmbeats</p> <p>Pierce, F.J., & Nowak, P. (1999). <i>Aspects of Precision Agriculture</i>. <i>Advances in Agronomy</i>, 67, 1–85. https://doi.org/10.1016/S0065-2113(08)60513-1</p> <p>Radanović, B., & Hrustek, L. (2021). <i>IoT and Big Data in Agriculture: A Review</i>. <i>Agronomy</i>, 11(4), 823. https://doi.org/10.3390/agronomy11040823</p> <ul style="list-style-type: none"> • Wolfert, S., Ge, L., Verdouw, C., & Bogaardt, M.-J. (2017). <i>Big Data in Smart Farming – A Review</i>. <i>Agricultural Systems</i>, 153, 69–80. https://doi.org/10.1016/j.agsy.2017.01.023 • Zhang, Y., Wang, G., Wang, Y., & Wang, J. (2020). <i>Precision Agriculture Technology for Crop Farming</i>. CRC Press. ISBN: 9780367331770. • Zhao, Y., Zhang, Y., Wang, C., & Zhao, J. (2023). <i>Cloud-Based Smart Agriculture Platform Using IoT and AI Technologies</i>. <i>Computers and Electronics in Agriculture</i>, 205, 107635.

COURSE 2:

SMART IRRIGATION AND FERTILISATION

This course focuses on the practical application of modern and sustainable irrigation and fertilisation systems in agriculture. It is strongly oriented toward resource efficiency, environmental responsibility, and the use of IoT and renewable energy.

Methodological features

The course follows a blended approach combining online and face-to-face learning. It is practical in focus and designed to help learners transfer knowledge directly into agricultural practice.



COURSE 2 - Curriculum

Course No.2		Smart Irrigation and Fertilisation
Course content		
The main aim of the course	The aim of the training is to prepare students and farmers for the practical implementation of modern, sustainable irrigation and fertilisation systems in agriculture. Participants will learn the basics of smart irrigation based on sensor data and Internet of Things (IoT) technologies to accurately manage water and fertilizers. The training also teaches how to integrate these solutions with renewable energy sources – e.g. powering water pumps with solar energy. The ecological and economic aspects of modern agriculture are also discussed, including ways to reduce fertilizer losses. A key objective is to increase the efficiency of agricultural production while reducing costs and environmental impact. Thanks to the practical approach, participants will be able to use the acquired knowledge directly in the field or in their future professional work.	
Topic/ Subject	<ol style="list-style-type: none"> 1. Fundamentals of Smart Irrigation 2. Implementing IoT for Smart Irrigation 3. Sustainable Fertilization Practices 4. Integrated Irrigation and Fertilization Systems 5. Renewable Energy-Powered Irrigation Systems 	
Learning		
Detailed course objective	The aim of the course is to deepen the participants' knowledge of modern and sustainable technologies in irrigation and fertilization of plants, with particular emphasis on solutions based on the Internet of Things (IoT) and renewable energy. The course aims to prepare students and farmers to independently plan, implement and manage smart irrigation systems and integrate them into fertilization systems, respecting the environment and optimizing production costs. Participants will also learn how to analyse sensor data, use it to make agronomic decisions, and how to maintain and modernise technical systems on farms.	
Knowledge	<ul style="list-style-type: none"> • How modern smart irrigation and fertilization systems work. • What are the basics and applications of the Internet of Things (IoT) in agriculture. • How to select and configure sensors for soil moisture, temperature, sunlight, etc. • What are the ecological and economic advantages of using sustainable fertilization practices. • How to integrate irrigation systems with renewable energy sources, e.g. photovoltaics. • What are the basic components and functions of fertigation systems • What is the process of collecting, transmitting and analyzing data from IoT systems on the farm. 	
Abilities	<ul style="list-style-type: none"> • Design and implement a simple smart irrigation system on your farm. • Install and calibrate the measurement sensors (soil, climate) and connect them to the IoT system. • Analyse environmental data and optimise water and fertiliser use based on it. • Integrate fertilization systems with irrigation systems (fertigation). • Select the right source of renewable energy to power technical systems. • Use applications and interfaces to manage IoT systems in agriculture. • Identify errors and problems in systems and take maintenance and preventive actions. 	

Competence	
Training and assessment standard	
Planned educational activities and teaching methods	Blended Approach – online and face-to-face methods will be used to ensure that individuals understand the course
Method of transmission	Online e-learning courses
Teaching hours	3 - 5h Each module: approx. 0.5–1 hours, including activities and short quiz
EQF level	3-4
Assessment methods	<ul style="list-style-type: none"> • Self-assessment quiz at the end of the course • Optional reflection assignments or open-ended questions
Recommend or required reading	https://futurepump.com/the-ultimate-guide-to-solar-water-pumps/?utm_source=chatgpt.com https://irrigreen.com/blogs/sprinkler-systems/smart-irrigation-solutions?srltid=AfmBOorzLvzunyyJCT7Um1EFyztTdupXsalh52NQ3vdAGagXEhxRQdZJ https://www.youtube.com/watch?v=Dqssy6S0Xoc



COURSE 3:

MECHATRONICS IN AGRICULTURE

This course introduces learners to the principles and applications of mechatronics in agricultural practice. It focuses on the integration of mechanics, electronics, sensors, and robotics in modern farming systems.

Methodological features

The course uses microlearning slides, case studies, glossaries, discussion tasks, and scenario-based problem solving. It is designed for self-paced learning, blended delivery, VET workshops, and integration into broader agricultural training programmes.



COURSE 3: Curriculum

Course No.3	Course title: Mechatronics in Agriculture
Course content	
The main aim of the course	To provide learners with foundational and applied knowledge of mechatronics and its relevance to precision farming, automation, and sustainable agriculture practices.
Topic/Subject	<ol style="list-style-type: none"> 1. Fundamentals of Renewable Energy in Agriculture 2. Agricultural Robots 3. Sensors and Actuators 4. Maintenance & Troubleshooting 5. Future Trends
Learning	
Detailed course objective	This course introduces learners to mechatronic systems used in agriculture. It covers the integration of mechanical engineering, electronics, sensors, and robotics to improve efficiency, sustainability, and productivity in farming. Learners will gain knowledge of current technologies, practical applications, and future trends relevant to small farms, VET learners, and trainers.
Knowledge	<ul style="list-style-type: none"> • To understand the basic principles of mechatronics and its relevance in agriculture. • To identify key technologies such as sensors, actuators, and robotics. • To recognise real-world applications of smart machinery in farming.
Abilities	<ul style="list-style-type: none"> • To identify and describe different types of sensors and actuators used in smart agriculture. • To operate basic mechatronic systems and interpret sensor data in a farming context. • Troubleshoot common issues and perform routine maintenance on smart equipment. • To apply robotics and automation principles to practical agricultural scenarios.
Competence	
Training and assessment standard	
Planned educational activities and teaching methods	<ul style="list-style-type: none"> • Thematic microlearning slides with visuals and examples • Use of real-world case studies to illustrate technology application • Glossary and infographics for better comprehension of technical terms • Discussion prompts and problem-based learning activities • Scenario-based thinking (e.g. farm problem – suitable automation solution)
Method of transmission	<ul style="list-style-type: none"> • Self-paced e-learning • Blended learning (online + classroom) • Can be delivered via digital platforms or during VET workshops • Suitable for integration into existing agricultural training programmes

Teaching hours	<ul style="list-style-type: none"> • Estimated 8–10 total hours • Each module: approx. 1.5–2 hours, including activities and short quiz
EQF level	EQF Level 4–5
Assessment methods	<ul style="list-style-type: none"> • Self-assessment quiz at the end of the course • Optional reflection assignments or open-ended questions • Practical task suggestion (e.g., identifying automation needs on a learner’s farm or training plan) • Trainer-led debrief (in blended delivery)
Recommended or required reading	<ul style="list-style-type: none"> • DAYIOĞLU, Mehmet Ali a TURKER, Ufuk. Digital Transformation for Sustainable Future - Agriculture 4.0: A review. Online. <i>Tarım Bilimleri Dergisi</i>. 2021. ISSN 1300-7580. Available at: https://doi.org/10.15832/ankutbd.986431. • SOUSSI, Abdellatif; ZERO, Enrico; SACILE, Roberto; TRINCHERO, Daniele a FOSSA, Marco. Smart Sensors and Smart Data for Precision Agriculture: A Review. Online. <i>Sensors</i>. 2024, vol. 24, no. 8, s. 2647. ISSN 1424-8220. Available at: https://doi.org/10.3390/s24082647. • FUENTES-PEÑAILILLO, Fernando; GUTTER, Karen; VEGA, Ricardo a SILVA, Gilda Carrasco. Transformative Technologies in Digital Agriculture: Leveraging Internet of Things, Remote Sensing, and Artificial Intelligence for Smart Crop Management. Online. <i>Journal of Sensor and Actuator Networks</i>. 2024, vol. 13, no. 4, s. 39. ISSN 2224-2708. Available at: https://doi.org/10.3390/jsan13040039. • Assimakopoulos, Fotis & Vassilakis, Costas & Margaris, Dionisis & Kotis, Konstantinos & Spiliotopoulos, Dimitris. (2024). The Implementation of “Smart” Technologies in the Agricultural Sector: A Review. <i>Information</i>. 15. 466. 10.3390/info15080466. • FAROOQ, Muhammad Shoaib; RIAZ, Shamyala; ABID, Adnan; UMER, Tariq a ZIKRIA, Yousaf Bin. Role of IoT Technology in Agriculture: A Systematic Literature Review. Online. <i>Electronics</i>. 2020, vol. 9, no. 2, s. 319. ISSN 2079-9292. Available at: https://doi.org/10.3390/electronics9020319. • BALASUNDRAM, Siva K.; SHAMSHIRI, Redmond R.; SRIDHARA, Shankarappa a RIZAN, Nastaran. The Role of Digital Agriculture in Mitigating Climate Change and Ensuring Food Security: An Overview. Online. <i>Sustainability</i>. 2023, vol. 15, no. 6, s. 5325. ISSN 2071-1050. Available at: https://doi.org/10.3390/su15065325.

COURSE 4:

INTEGRATION OF RENEWABLE ENERGY IN AGRICULTURE

This course presents the role of renewable energy in agriculture and shows how its integration can improve sustainability, productivity, and farm-level energy independence.

Methodological features

The course combines interactive lectures, visual materials, case studies, practical exercises, discussions, and problem-solving activities. It is suitable for blended learning and self-paced study.



COURSE 4: CURRICULUM

Course No.4	Course title: Integration of renewable energy in agriculture
Course content	
The main aim of the course	Presenting the possibilities of using renewable energy in agriculture and the benefits of its integration with agricultural processes.
Topic/Subject	<ol style="list-style-type: none"> 1. Introduction to renewable energy in agriculture 2. Solar energy applications: irrigation systems, storage units, and off-grid energy 3. Wind and biomass energy for farming operations 4. Renewable energy systems in greenhouses and controlled environments 5. Government policies, financial incentives, and regulatory frameworks
Learning	
Detailed course objective	<ul style="list-style-type: none"> - Understand how renewable energy enhances productivity and sustainability in agriculture. - Learn how to configure and manage photovoltaic systems to ensure their long-term performance. - Explore how wind turbines and biomass systems can support energy independence on farms. - Examine the role of renewables in smart greenhouses and modern cultivation methods. - Navigate policy tools, funding sources, and energy storage options in the agricultural context.
Knowledge	<ul style="list-style-type: none"> - How renewable energy can increase agricultural productivity and contribute to a more sustainable future for the sector. - How to effectively configure and manage solar panel systems, ensuring long-term performance and reliability in agricultural settings. - How wind energy & biomass can be integrated into agricultural practices, helping to achieve energy independence while promoting environmental sustainability. - How renewable energy solutions can improve greenhouse operations, promote sustainability, and contribute to energy independence in modern agriculture. - How to secure financing for renewable energy initiatives, comply with regulations, and utilize innovative energy storage solutions to optimize energy use in modern agriculture.
Skills	<ul style="list-style-type: none"> - Apply technical knowledge to implement renewable energy solutions on the farm. - Analyse case studies and adapt solutions to various agricultural contexts. - Integrate renewable energy technologies into existing agricultural infrastructures. - Manage farm-level energy production, consumption, and system maintenance. - Navigate policy, funding, and compliance aspects related to renewable energy in agriculture. - Support the transition to sustainable farming practices through innovation and energy planning.
Competence	<ul style="list-style-type: none"> - Understand how renewable energy increases productivity and sustainability in agriculture. - Know how wind turbines and biomass systems can support energy independence on farms. - Be able to identify the role of renewable energy sources in smart greenhouses and modern farming methods. - Assess the suitability of renewable energy sources for specific agricultural operations.

Training and assessment standard	
Planned educational activities and teaching methods	<ul style="list-style-type: none"> - Interactive lectures and visual presentations - Real-life case studies from various farms and regions - Practical exercises on configuring and maintaining renewable systems - Self-assessment quiz at the end of the course - Group discussions and problem-solving workshops - Analysis of financing, policy, and innovation in agricultural energy
Method of transmission	Blended-learning or self-paced learning
Teaching hours	5 -10
EQF level	3-5
Assessment methods	<p>The assessment strategy for this course is designed to evaluate learners' understanding of theoretical content and their ability to apply knowledge in practical, real-world contexts. The following assessment methods are employed:</p> <ul style="list-style-type: none"> • Self-assessment quizzes: The Course ends with a set of multiple-choice or true/false questions to reinforce key concepts and check understanding. • Case study analysis: Learners are encouraged to reflect on real-world examples and draw parallels with their own local contexts, either through guided exercises or optional assignments (where implemented). • Reflective prompts: Throughout the modules, short questions encourage learners to consider how the techniques presented can be adapted to their agricultural environment, supporting deeper engagement. • Completion tracking: The platform monitors progress through the modules to ensure learners engage with all required content. • Optional summative test (if implemented by training providers): For blended or formal VET integration, a final quiz or short written reflection may be used to certify knowledge acquisition. <p>This flexible assessment framework is suitable for both independent learners and VET trainees under instructor supervision.</p>
Recommended or required reading	<p>https://www.mdpi.com/2071-1050/11/17/4714</p> <p>https://www.youtube.com/watch?v=Vz11Xt-TxP4</p> <p>https://www.youtube.com/watch?v=xy9nj94xvKA</p> <p>https://www.irena.org/publications/2021/Nov/Renewable-heating-and-coolingAndEU</p> <p>https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules_en</p> <p>https://www.youtube.com/watch?v=tW01dWklot8</p> <p>https://www.youtube.com/watch?v=zXV1Vy_XECY</p>

COURSE 5:

CLIMATE-SMART AGRICULTURE TECHNIQUES

This course is designed to help learners respond to climate change challenges through sustainable, resilient, and environmentally responsible agricultural practices. It promotes climate-smart agriculture as a balance between productivity, adaptation, and mitigation.

Methodological features

The course is delivered through self-contained microlearning units supported by visual presentations, narrated explanations, case studies, quizzes, infographics, videos, and guided reflection. It is designed mainly for online delivery but can also support blended learning in VET settings.



COURSE 5: CURRICULUM

Course No.5		Climate-Smart - Agriculture Techniques
Course content		
The main aim of the course	To provide learners with the essential knowledge, skills, and strategies to adapt agricultural practices to climate change challenges, by promoting sustainable, resilient, and environmentally responsible approaches in farming. The course aims to strengthen farmers' and VET learners' capacity to implement climate-smart agriculture (CSA) techniques that balance productivity, adaptation, and mitigation.	
Topic/Subject	Contents/main points Climate-Smart Agriculture Techniques: Enhancing resilience and sustainability in farming practices. Module 1 – Introduction to Climate-Smart Agriculture (CSA) Module 2 – Adapting Crop Production to Climate Variability Module 3 – Soil Conservation and Carbon Sequestration Module 4 – Water Resource Management under Changing Climates Module 5 – Reducing Emissions in Livestock and Crop Systems	
Learning		
Detailed course objective	The course aims to provide learners with a comprehensive understanding of climate-smart agriculture (CSA) as a strategy to enhance the sustainability, productivity, and resilience of farming systems in the context of climate change. Through five interconnected modules, the course equips learners with practical tools and knowledge to assess climate risks, implement adaptive and mitigative practices, apply agroecological principles, and integrate technological and financial solutions for climate-resilient agriculture.	
Knowledge	By the end of the course, learners will: <ul style="list-style-type: none"> • Understand the key concepts and pillars of climate-smart agriculture (productivity, adaptation, mitigation). • Be familiar with the causes and effects of climate change on agriculture. • Know how to assess climate risks and vulnerabilities at farm level. • Understand smart climate practices and their role in sustainable farming. • Acquire knowledge on tools, technologies, and funding instruments that support CSA strategies. 	
Abilities	Learners will be able to: <ul style="list-style-type: none"> • Analyse the impact of climate change on agricultural systems. • Identify climate risks and propose adequate adaptation or mitigation strategies. • Design context-based interventions using agroecological and sustainable practices. • Apply decision-support tools to plan climate-smart interventions on farms. • Evaluate the feasibility and relevance of technological and financial tools to support CSA implementation. 	
Competence		

Training and assessment standard	
Planned educational activities and teaching methods	<p>The course is structured around five self-contained yet complementary modules, each delivered through microlearning units. The educational activities are designed to promote autonomous learning, critical thinking, and practical application of knowledge. Planned methods include:</p> <ul style="list-style-type: none"> • Visual presentations with narrated explanations • Case studies illustrating real-world applications of CSA • Interactive self-assessment quiz • Hyperlinks to external resources for further study • Infographics and videos to simplify complex concepts • Guided reflections on learners' own local farming contexts <p>Blended learning opportunities may also include group discussions or workshops when integrated in VET settings.</p>
Method of transmission	<p>The course is delivered fully online via the SmartSkills platform. The format follows microlearning principles, with each module divided into short, digestible learning units designed for maximum flexibility and accessibility. Learners can access materials asynchronously, progressing at their own pace. Content is enhanced through multimedia elements to support visual and auditory learning styles.</p>
Teaching hours	<p>3 - 5h</p> <p>Each module: approx. 0.5–1 hours, including activities and a short quiz - give more time for additional reading</p>
EQF level	EQF Level 4–5
Assessment methods	<p>The assessment strategy for this course is designed to evaluate learners' understanding of theoretical content and their ability to apply knowledge in practical, real-world contexts. The following assessment methods are employed:</p> <ul style="list-style-type: none"> • Self-assessment quizzes: The Course ends with a set of multiple-choice or true/false questions to reinforce key concepts and check understanding. • Case study analysis: Learners are encouraged to reflect on real-world examples and draw parallels with their own local contexts, either through guided exercises or optional assignments (where implemented). • Reflective prompts: Throughout the modules, short questions encourage learners to consider how the techniques presented can be adapted to their agricultural environment, supporting deeper engagement. • Completion tracking: The platform monitors progress through the modules to ensure learners engage with all required content. • Optional summative test (if implemented by training providers): For blended or formal VET integration, a final quiz or short written reflection may be used to certify knowledge acquisition. <p>This flexible assessment framework is suitable for both independent learners and VET trainees under instructor supervision.</p>
Recommended or required reading	<ul style="list-style-type: none"> • https://youtu.be/KYeFNnPJVEg • https://www.fao.org/climate-smart-agriculture-sourcebook/production-resources/module-b1-crops/chapter-b1-2/fr/ • Pearl Millet: The Drought-Resistant Grain • The Power Of AI's Impact On Smart Greenhouses For Sustainable Farming • 10 WAYS TO PREVENT SOIL EROSION • https://alliancebioiversityciat.org/stories/simple-ways-boost-benefits-climate-smart-agriculture • World Food Forum 2023 highlights soil degradation and health - Agriland.ie • Paolo Maria Mosca - Azienda Agricola Mosca • Livestock and enteric methane - YouTube • https://openknowledge.fao.org/server/api/core/bitstreams/1a3714ba-5e7e-407d-acf2-1faa4d07a160/content • https://www.fao.org/climate-smart-agriculture/policies-planning/en/ • https://www.fao.org/climate-smart-agriculture/knowledge/practices/en/ • https://www.fao.org/climate-smart-agriculture/international-fora/en/ • https://www.mase.gov.it/portale/climate-smart-agricolture-e-sprechi-alimentari

COURSE 6:

BRINGING INNOVATION TO FARMS

This course focuses on the role of digital tools and integrated smart systems in future-proofing farming. It is designed for agricultural educators as well as learners such as farmers and smallholders.

Methodological features

The course includes module-specific activities such as identifying sensors and actuators, recognising sensor types, self-reflection, group discussion, and ranking the benefits of technologies. It can be delivered in self-guided, online, blended, or classroom formats.



COURSE 6: CURRICULUM

Course No.6	Course title: Bringing to Innovation to Farms
Course content	
The main aim of the course	To equip today's agricultural educators and agricultural learners (farmers/smallholders) with awareness and knowledge of the opportunities that lie within digital tools and how these tools can help to future-proof farming.
Topic/Subject	Module Titles
	<ol style="list-style-type: none"> 1. Introduction to Control Systems 2. Greenhouse Automation 3. Livestock Monitoring Systems 4. Field Automation & Real-Time Monitoring 5. Integrating Smart Systems for Whole-Farm Management
Learning	
<p>Detailed course objective including:</p> <ul style="list-style-type: none"> • Knowledge • Abilities • Competence 	<p>Module 1: Explore how control systems such as SCADA and PLCs are the digital brains behind smart farms. Learners will gain insight into how sensors, controllers & actuators work together to monitor and automate processes like irrigation, feeding, and climate control—improving precision and reducing environmental impact.</p> <p>Module 2: Dive into the world of IoT-enabled greenhouses, where temperature, humidity, and lighting are fine-tuned automatically. By studying real-life case studies learners will see how vertical farming and smart greenhouses are transforming yields and slashing resource use.</p> <p>Module 3: Discover how wearable sensors, automated feeding systems, and environmental controls help farmers monitor animal health in real-time. From preventing disease to improving nutrition, automation leads to better animal welfare, higher productivity, and sustainable practices.</p> <p>Module 4: Study how drones, AI, and smart irrigation systems boost crop health and conserve water. Real-time data helps farmers make smarter decisions on fertilisation and planting, optimising every drop and every square metre.</p> <p>Module 5: This module ties it all together—showing how diverse technologies can be integrated through cloud platforms for holistic, remote farm management. The future farm is connected, responsive, and efficient—reducing waste, boosting yields & protecting natural ecosystems.</p>

Training and assessment standard	
Planned educational activities and teaching methods	M1: Slide 17 – identification of Sensors, Controllers & Actuators M2: Slide 15 – Recognising types of sensors M3: Slide 16 – Self-reflection and group discussion M4: Slide 17 – Implementation of field operation automation M5: Slide 16 – Technology Benefit Ranking
Method of transmission	Self-guided, Online, Blended or classroom
Teaching hours	~30 minutes per module (2.5hours)
EQF level	3-4 EQF
Assessment methods	<p>The assessment strategy for this course is designed to evaluate learners' understanding of theoretical content and their ability to apply knowledge in practical, real-world contexts. The following assessment methods are employed:</p> <ul style="list-style-type: none"> • Self-assessment quizzes: The Course ends with a set of multiple-choice or true/false questions to reinforce key concepts and check understanding. • Case study analysis: Learners are encouraged to reflect on real-world examples and draw parallels with their own local contexts, either through guided exercises or optional assignments (where implemented). • Reflective prompts: Throughout the modules, short questions encourage learners to consider how the techniques presented can be adapted to their agricultural environment, supporting deeper engagement. • Completion tracking: The platform monitors progress through the modules to ensure learners engage with all required content. • Optional summative test (<i>if implemented by training providers</i>): For blended or formal VET integration, a final quiz or short written reflection may be used to certify knowledge acquisition. <p>This flexible assessment framework is suitable for both independent learners and VET trainees under instructor supervision.</p>
Recommended or required reading	information on SCADA NTC thermistors and RTDs Smart sensors and Internet of Things (IoT) Smart irrigation Policy measures for water efficiency Cloud-based platforms

CROSS-COURSE METHODOLOGICAL OBSERVATIONS

Across all six courses, several shared methodological characteristics can be identified:

- a modular and microlearning-based structure
- a balance between theory and practical application
- strong relevance to current agricultural challenges
- flexibility in delivery and adaptation
- emphasis on digitalisation, sustainability, and innovation
- use of active learning, reflection, and self-assessment

Together, these features make the Smart Skills curriculum suitable for a wide range of learners and educational settings. The courses can function both as standalone learning units and as complementary elements within a broader vocational or training programme.

RECOMMENDATIONS FOR USE IN A METHODOLOGICAL GUIDE

For the purposes of a methodological handbook, each course can be presented as a model curriculum unit that includes:

- course purpose
- main topics
- expected learning outcomes
- suggested teaching methods
- delivery formats
- estimated study time
- assessment options

RECOMMENDATIONS FOR USE IN A METHODOLOGICAL GUIDE

In this form, the material becomes highly useful for:

- curriculum planning
- lesson design
- workshop preparation
- adaptation to local educational contexts
- integration into VET and adult education programmes

A methodological guide based on these courses should therefore focus not only on *what* is taught, but also on *how* the content can be meaningfully implemented in teaching practice.



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