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WP3 – Joint Curriculum in Digital Farming

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Abstract: The revised and finalized version of the joint curriculum in digital farming has been produced in collaboration between all project partners based on the results of the peer-review events and the suggestions gathered from associated partners.

The SEED Project Consortium consists of:

Partner	Name	Country
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3	EGInA Srl	IT
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5	Slovenská poľnohospodárska univerzita v Nitre	SK
6	Universiteit Gent	BE
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Table of contents

1	INTRODUCTION	- 3 -
2	CORE – AGRIBUSINESS	- 4 -
2.1	AGRIBUSINESS ECONOMY	- 4 -
2.2	BUSINESS MODELS	- 5 -
2.3	PRODUCTION MODELS.....	- 6 -
2.4	MARKETING AND SELLING MODELS	- 7 -
2.5	LEARNING ASSESSMENT OF AREA A.....	- 8 -
3	CORE – DIGITAL	- 9 -
3.1	INFORMATION AND DATA LITERACY	- 9 -
3.2	COMMUNICATION AND COLLABORATION.....	- 10 -
3.3	DIGITAL CONTENT CREATION.....	- 11 -
3.4	PROBLEM SOLVING.....	- 12 -
3.5	LEARNING ASSESSMENT OF AREA B.....	- 13 -
4	CORE – INNOVATION	- 14 -
4.1	FOUNDATIONS	- 14 -
4.2	DIGITAL TRANSFORMATION.....	- 15 -
4.3	FEASIBILITY STUDY AND PROJECT MANAGEMENT.....	- 16 -
4.4	CHANGE MANAGEMENT.....	- 17 -
4.5	LEARNING ASSESSMENT OF AREA C.....	- 19 -
5	DOMAIN APPLICATION	- 20 -
5.1	STRATEGIC PLANNING AND SUSTAINABLE MANAGEMENT	- 20 -
5.2	PRECISION AGRICULTURE.....	- 23 -
5.3	AGRIFOOD AND VALUE ADD SERVICES	- 27 -
5.4	DIGITAL MARKETING AND E-COMMERCE	- 30 -
5.5	LEARNING ASSESSMENT OF AREA D.....	- 34 -

1 INTRODUCTION

The Joint Curriculum for the training of Digital Transformation Agent in Agriculture represents the main output of the SEED project and it has been developed in collaboration between all project partners starting from the analysis and elaboration into curricular units of the Learning Outcomes (LOs) identified in the final version of the related qualification profile, which has been developed in WP2 and validated thanks to the contribution of several stakeholders involved in national and international peer-review events.

The Units of the curriculum have been designed following the guidelines provided by the WP3 leader, AIN the Navarra Industrial Association, and based on the qualification structure as it presented here below:

Level	Topic	Competence units
CORE/Agribusiness	Agribusiness economy	A.1 Agribusiness economy
	Business models	A.2 Business models and value chain integration
	Production models	A.3 Production models
	Marketing and selling models	A.4 Marketing and selling models and processes
CORE/Digital	Information and data literacy	B.1 Evaluating and managing data, information and digital content in agribusiness
	Communication and Collaboration	B.2 Interacting, sharing and collaborating through digital technologies in agribusiness
	Digital content creation	B.3 Developing digital content in agribusiness
	Problem solving	B.4 Identifying needs, technological responses and digital competences gap
CORE/Innovation	Foundations	C.1 Innovation as economic, technological and cultural process: framework
	Digital transformation	C.2 Digital transformation: enabling technologies, key drivers and their impacts
	Feasibility study and project management	C.3 Digital transformation: feasibility study and innovation management
	Change management	C.4 Organization and Human Resources Management drivers and enablers
Domain applications	Strategic planning and sustainable management	D.1 Sustainable key concepts
		D.2 Strategy, Data and Decision Support Systems
	Precision agriculture	D.3 Data sensors: platforms (drones and satellites) and agronomic sensors
		D.4 Using data: GIS and data modelling
		D.5 Agronomic resource management
	Agrifood and value add services	D.6 Integrated logistic
		D.7 Traceability
	Digital marketing and e-commerce	D.8 Digital marketing
		D.9 E-commerce ad customer experience

2 CORE – Agribusiness

2.1 Agribusiness Economy

COMPETENCE UNIT	A1: Agribusiness economy	Duration	6 ECTS = 150/180 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Know and know how to analyze the agribusiness sector <u>EC - Knowledge:</u> EC 1.1 Agribusiness: sector's structure (farm, industry, products) and status, at the global and local scales. Position in the general economic frame. Trends. EC 1.2 Agribusiness role in the current economic context. Main agribusiness strategies. New generation companies. <u>EC – Skills:</u> EC 1.3 Understand the economic structure of the agribusiness, in terms of market characteristics, demand/supply relations, pricing, (macro)trends, innovation EC 1.4 Understand the kind of strategies adopted at the different scales: single firms, network and consortia, regions and specific territories, global markets EC 1.5 Make a critical analysis of a known farm/industry</p> <p>C2: Know and know how to apply for community contributions <u>EC - Knowledge:</u> EC 2.1 Public policies and programmed supporting the agribusiness and its innovation (i.e. rural development plan; innovation and financing) EC 2.2 Technicalities about applications for admission to a Community project <u>EC – Skills:</u> EC 2.3 Identify the value drivers of the sector EC 2.4 Fill in a request for Community contributions (e.g. RDP), interacting and supporting other people</p>	<ol style="list-style-type: none"> 1. Agribusiness economy According to EC 1.1 – EC 1.5 <ul style="list-style-type: none"> • agribusiness: new generation companies • the role of technology in a company • agribusiness market • medium/long-term choices 2. Public policies and agribusiness innovation According to EC 2.1 – EC 2.4 <ul style="list-style-type: none"> • policies to support agribusiness • innovation and financing • rural development plan 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology, will provide students with information on the agrifood sector, the role of technology, selection criteria for the improvement of the fund and specific market trends. Competence will be assessed through a structured test. -- PROVIDE WRITTEN MATERIAL – According to EC 1.1 – EC1.3 2. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on a case described by the trainer and the data in their possession, will analyze a proposed company during a circle time moderated by the trainer. According to EC 1.4, EC 1.5 3. The trainer, through an expository methodology, will provide students with information about public support programmed. (e.g. rural development plan). Competence will be assessed through a structured test. -- PROVIDE WRITTEN MATERIAL – According to EC 2.1 – EC 2.3 4. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on the material provided by the trainer, will fill in an application for contributions. According to EC 2.4 	

2.2 Business Models

COMPETENCE UNIT	A2: Business models and value chain integration	Duration	6 ECTS = 150/180 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1 Identify and comment new agribusiness models <u>EC - Knowledge:</u> EC 1.1 Value chain in the agribusiness: primary production, transformation, distribution and usage, in the food and non-food markets <u>EC – Skills:</u> EC 1.2 Compare different value chain and integration models in the agribusiness economy, as well as the difference between food and non-food market</p> <p>C2 Analyze and compare different value chain integration models <u>EC - Knowledge:</u> EC 2.1 Value chain integration: rationales, benefits, impacts and their transformative costs EC 2.2 Innovation, digital transformation, and value chain integration: rationales and typical schemes EC 2.3 Value chain digital integration: case studies, limits and lessons learnt EC 2.4 European policies and programmed seen through the value chain approach <u>EC – Skills:</u> EC 2.5 Understand the value chain approach as a starting point in order to define an effective digital transformation strategy EC 2.6 Identify and comment typical schemes of innovation and digital transformation into value chain integration reality EC 2.7 Review EC 2.8 Analyze and framing real cases applying a value chain approach</p>	<p>1. New agribusiness models According to EC 1.1, EC 1.2</p> <ul style="list-style-type: none"> • Value chain in the agribusiness sector • Difference between food or non-food market products • Value chain approach: Is this the future? <p>2. integration between agriculture, food industry, logistic, health improvement and environment safeguard: a new value-driven approach According to EC 2.1 – EC 2.8</p> <ul style="list-style-type: none"> • Value chain integration models • Value chain integration: rationales, benefits, impacts and their transformative costs • Value chain digital integration models • The role of innovation and digital transformation 	<p>1. The trainer, through an expository methodology, will provide students with information about new agribusiness models such as value chain in the food and non-food market. Competence will be assessed through a semi-structured test. -- PROVIDE WRITTEN MATERIAL – According to EC 1.1, EC 1.2</p> <p>2. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on a case described by the trainer and the data in their possession, will analyze a proposed company during a debate moderated by the trainer. According to EC 1.4</p> <p>3. The trainer, through an expository methodology, will provide students with information about integration between different sector (e.g. agricultural, food industry etc.) and the role of innovation and digital transformation into new agribusiness integration models introducing real case studies. Competence will be assessed through a semi-structured test. -- PROVIDE WRITTEN MATERIAL – According to EC 2.1 – EC 2.3</p> <p>4. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on the material provided by the trainer, will analyze and frame real cases applying a value chain approach during a circle time According to EC 2.4</p> <p>5. This strategy uses active learning leveraging a problem-based learning methodology. Students, divided in small group, based on a case described by the trainer and the data in their possession, will elaborate a digital transformation plan for a proposed company during focus groups moderated by the trainer. According to EC 2.5</p>	

2.3 Production Models

COMPETENCE UNIT	A3: Production models	Duration	6 ECTS = 150/180 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1 identify and comment production models <u>EC - Knowledge:</u> EC 1.1 Main production processes and their interdependencies EC 1.2 Production process control EC 1.3 Environmental interdependencies and impacts <u>EC – Skills:</u> EC 1.4 Understand, analyze, and differentiate the key variables affecting the production processes (planning and managing), and their main functional relations EC 1.5 Compare different production processes of agribusiness firm and analyze their basic management principles EC 1.6 Analyze and compare different production scheduling and management techniques EC 1.7 Analyze environmental protection regulations and measures, define their impact on the environment</p> <p>C2: analyze a strategic digital approach to innovate productive processes <u>EC - Knowledge:</u> EC 2.1 Key variables of the production processes and their management strategies <u>EC – Skills:</u> EC 2.2 Analyze and framing real cases of production processes</p>	<p>1. Production models According to EC 1.1 – EC 1.7</p> <ul style="list-style-type: none"> • Production processes • Key variables affecting production processes: analysis and management • Interdependencies between production model: real agribusiness firm • Production processes controls • Production processes and environment <p>2. New strategic digital approach to innovate productive processes According to EC 2.1, 2.2</p> <ul style="list-style-type: none"> • Digital and production processes: analysis of real firms in order to know how present a strategic plan SMEs to innovate their productive process 	<p>1. The trainer, through an expository methodology, will provide students with information about production models, their control, and the impact of productions on environment. Competence will be assessed through a multiple-choice structured test. -- PROVIDE WRITTEN MATERIAL – According to EC 1.1 – EC 1.3</p> <p>2. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on a case described by the trainer and the data in their possession, will analyze several production processes in each key variable that affect them during a debate moderated by the trainer. According to EC 1.4</p> <p>3. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on a case described by the trainer and the data in their possession, will compare several productive processes in each production scheduling and management techniques that affect them during a debate moderated by the trainer. According to EC 1.5, EC 1.6</p> <p>4. This strategy uses active learning leveraging a problem-based teaching methodology. Students will compare several environmental protection regulations and their impact on the environment during a debate moderated by the trainer. According to EC 1.7</p> <p>5. The trainer, through various visits to sector realities, will show students how to write and present to SMEs a production process innovation plan. Competence will be assessed through an open-ended questions test. -- PROVIDE WRITTEN MATERIAL – According to EC 2.1,</p> <p>6. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on the material provided by the trainer, will analyze and frame real cases for innovative production processes According to EC 2.2</p>	

2.4 Marketing and selling models

COMPETENCE UNIT	A4: Marketing and selling models and processes	Duration	6 ECTS = 150/180 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1 Identify and comment marketing models and processes in the agribusiness sector <u>EC - Knowledge:</u> EC 1.1 Marketing and selling models and processes in the agribusiness sector EC 1.2 Key variables of the marketing and selling processes of the agribusiness firms <u>EC – Skills:</u> EC 1.3 Understand the key variables affecting the marketing and selling processes (strategic design, planning and managing), and their main functional relations EC 1.4 Understand the basic management principles of the marketing and selling processes of an agribusiness firm</p> <p>C2 Analyze a strategic digital approach to innovate commercial processes <u>EC - Knowledge:</u> EC 2.1 Basic strategic management principles of the agribusiness firms <u>EC – Skills:</u> EC 2.2 Analyze and framing real cases of marketing and selling processes</p>	<ol style="list-style-type: none"> 1. Key variables of the agribusiness marketing model According to EC 1.1 – EC 1.4 <ul style="list-style-type: none"> • Marketing and selling models • Marketing and selling processes • Key variables on marketing and selling processes • Basic management principles 2. Innovation on commercial processes According to EC 2.1, EC 2.2 <ul style="list-style-type: none"> • Marketing and selling processes and management strategies: analysis of real firms in order to know how present a strategic plan to submit to SMEs to innovate their commercial process 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology, will provide students with information and practical examples and case studies about marketing and selling models and processes -- PROVIDE WRITTEN MATERIAL – According to EC 1.1, EC 1.2 2. Students will compare different keys variables affecting the market and selling processes, during a debate moderated by the trainer According to EC 1.3 3. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on a case described by the trainer and the data in their possession, will analyze basic management principles of the marketing processes of an agribusiness firm, during a debate moderated by the trainer. Competence will be assessed through a questionnaire provided by the trainer. According to EC 1.4 4. The trainer, through various visits to sector realities, will show students how to write and present to SMEs a marketing process agribusiness innovation plan -- PROVIDE WRITTEN MATERIAL – According to EC 2.1 5. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on the material provided by the trainer, will analyze and frame real cases of innovative marketing processes According to EC 2.2 	

2.5 Learning Assessment of AREA A

TRAINING MODULE		
	COMPETENCE UNIT	ACTIVITIES AND EVALUATION TOOLS
CORE – Agribusiness	A1 - Agribusiness economy	C1. Prepare a portfolio about the Company he/she is trained in gathering all the information collected during the WBL.
		C2. The teacher provides the students with some scenarios (up to 5) regarding local companies. Students should be able to identify relevant funding opportunities according to scenarios characteristics
		C2. Identify the funding opportunities during the WBL period. The students will be asked to support the company to identify potential opportunity and Access related platforms.
	A2 - Business models and value chain integration	C1. Comparing the advantages of using innovative techniques in different business scenarios. The teacher or the company owner should provide existing data in order to allow the students to make the analysis and the most appropriate choice.
		C2. The students, based on the material provided by the teacher, will analyze and frame real cases applying a value chain approach during a circle time
	A3 - Production models	C1. The students, based on a case described by the teacher and the data in their possession, will analyze several production processes in each key variable (environmental impact) that affect them during a debate moderated by the teacher
		C2. Given a real study case, students should to write and present to a SME a production process innovation plan listing advantages and disadvantages (economic, production, environmental, etc)
	A4 – Marketing and selling models and processes	C1. Compare different marketing and selling models and processes based on case studies
		C2. Compare different marketing and selling models and processes that could be beneficial to the company
		Students will have to collect all the relevant information in a document and discuss orally with teacher or the company tutor highlighting the key aspects emerged during the classes and the traineeship in relation to A1-A4. There will be an ongoing evaluation on the topics related to A1-A4 and a final project evaluation.

3 CORE – Digital

3.1 Information and data literacy

COMPETENCE UNIT	B.1 Evaluating and managing data, information and digital content in the agribusiness	Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1 Describe the basic principles of data management usable in data produced by agribusiness firm. <u>EC - Knowledge:</u> EC 1.1 Differences and relations between data, information, and knowledge EC 1.2 Types of data/information produced/used by an agribusiness firm EC 1.3 Principles and methods of data quality assessment EC 1.4 Public and private web repositories of data potentially relevant in agribusiness management <u>EC - Skills</u> EC 1.5 Understand the core concepts of the digital approach EC 1.6 Understand the digital lexicon EC 1.7 Identify data/information, their quality and value</p> <p>C2 Analyze data of existing agribusiness firm and create data model according type of data. <u>EC - Knowledge:</u> EC 2.1 Digital tools for personal productivity—managing data, information, and digital content <u>EC - Skills</u> EC 2.2 Use in autonomy the principal digital tools—finding and managing data EC 2.3 Design and use simple data management models for agribusiness information EC 2.4 Review and develop digital competence and performance of others</p>	<p>1. Data and their management According to EC 1.1 – EC 1.7</p> <ul style="list-style-type: none"> • Foundations of data management: <ul style="list-style-type: none"> ○ Data, information, and knowledge ○ Benefits of data management ○ Data management plan • Information system <ul style="list-style-type: none"> ○ Definition of information system ○ Foundation of information system ○ Relation between information system and agribusiness ○ Information systems and information technology • Finding and managing data from agribusiness information web • Quality of data in agribusiness • Evaluation of quality of data <p>2. Digital tools of managing data According to EC 2.1 – EC 2.3</p> <ul style="list-style-type: none"> • Organizing data in data management • Principle of digital tools • Application software <ul style="list-style-type: none"> • Utility programs • Spreadsheet software • Relational database software 	<p>1. The trainer, through an expository methodology, will provide students with information about foundation of data management: differences between data, information, knowledge, principles of data management and how data management works. This will be supported by written materials and presentation. According to EC 1.1 – EC 1.3</p> <p>2. This strategy uses active learning leveraging a problem-based teaching methodology. Students, based on a case study, will analyze agribusiness Web information and identify relevant data for create data model. In order to carry out this activity, it will be necessary to plan and apply the analysis to be carried out. Competence will be assessed through students' presentations.</p> <p>3. The trainer, through an expository methodology, will provide students with principles of data model, digital tools used in data management, and a description of how they work. This will be supported by demonstration of digital tool for data management. According to EC 2.1, EC 2.2</p> <p>4. The trainer will provide the students with: application software, basic principles of relational database software and technique of create simple database. This will be supported by using application software for relational database. After using software and create simple database, the trainer will ask guided questions from relational database. According to EC 2.3</p>	

3.2 Communication and Collaboration

COMPETENCE UNIT	B.2 Interacting, sharing and collaborating through digital technologies in the agribusiness	Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Describe digital technologies usable in agriculture, supporting interaction. <u>EC - Knowledge:</u> EC 1.1. Digital technologies supporting interaction, integration and sharing in agribusiness: ecosystem, characteristics, requirements, investment, and maintenance costs EC 1.2. Use of digital technologies and their added value in the agribusiness sector: review EC 1.3. Cloud computing, data storage, and their potential applications: foundations and point of view in agribusiness/agriculture sectors EC 1.4. Cybersecurity: risks, technologies, costs: malware, cyberattacks; risks in the electronic commerce <u>EC - Skills</u> EC 1.5. Understand the real and potential use of digital technologies supporting interaction, integration, collaboration, ad sharing in the agribusiness. EC 1.6. Identify possible risks, their impact, and the security requirements</p> <p>C2: Apply digital technologies supporting interaction in agriculture sector. <u>EC - Knowledge:</u> EC 2.1. Data property EC 2.2. Digital tools for personal productivity—communication and collaboration <u>EC - Skills</u> EC 2.3. Understand data property in the Cloud and assume the necessary measures to avoid legal controversies EC 2.4. Identify requirements and costs of hardware and software technologies, in a value-added approach to the agribusiness EC 2.5. Support the organization design in order to use ICT in cooperative work and teamwork EC 2.6. Use in autonomy the principal digital tools—finding and managing data EC 2.7. Review and develop digital competence and performance of others</p>	<p>1. Digital technologies According to EC 1.1 – EC 1.6</p> <ul style="list-style-type: none"> • Definition of digital technologies. • The importance of digital technologies • Application of digital technologies and interaction • Foundations of digital technologies: <ul style="list-style-type: none"> ○ Computer technology, computer hardware components ○ Computer peripherals ○ Mobile devices ○ Networking devices ○ Operating systems, common application software and their functions • Sharing information • Data storage <ul style="list-style-type: none"> ○ Definition and characteristics of data storage ○ Benefits of data storage • Cybersecurity <ul style="list-style-type: none"> • Introducing and role of cyber security • Malware and types • Cyberattacks and how to prevent them • Internet and electronic commerce <p>2. Digital technologies and digital tools supporting interaction According to EC 1.5, EC 1.6, EC 2.1 – EC 2.3</p> <ul style="list-style-type: none"> • Main characteristics of digital technologies and digital tools • Requirements and costs of technologies/tools • Data storage applications <ul style="list-style-type: none"> • Potential applications of data storage • Data and properties • Operational characteristics • Cloud services available • Cybersecurity applications <ul style="list-style-type: none"> ○ Antivirus, firewall ○ Devices and possibility of cybersecurity ○ Cybersecurity applications available • Management in the use of digital technologies 	<p>1. The trainer, through an expository methodology, will provide students with an overview of digital technologies, with related definitions and how data digital technologies work with regards to agribusiness/agriculture sectors. This will be supported by written materials and presentation. According to EC 1.1 – EC 1.4.</p> <p>2. Students, in groups of four, based on a case study will perform a review of digital technology usable for selected agriculture sector. In order to carry out this activity, it will be necessary to plan and apply the analysis of requirements of the specified agriculture sector. The conclusions of the group will be gathered in presentation form.</p> <p>3. This strategy uses active learning leveraging a problem-based teaching methodology. The trainer will provide the students with basic applications of digital technologies in selected agriculture sector, and techniques to create a simple system. This will be supported by using hardware and software applications of digital technologies. After creating a simple application, the trainer will ask guided questions about the management of the parts of the created simple applications. According to EC 2.1 – EC 2.7.</p>	

3.3 Digital content creation

COMPETENCE UNIT	B.3 Developing digital content in the agribusiness		Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Analyze the current state for digital tools and content serving agricultural sectors and firms <u>EC - Knowledge:</u> EC 1.1. Digital multimedia format: images, sounds, data EC 1.2. Digital integration between multimedia sources and content <u>EC - Skills</u> EC 1.3. Understand the real and potential use of digital content in supporting strategic and operative decision making, as well as in the market/customer relations. EC 1.4. Identify the potential fields, the information available and their use in digital content creation.</p> <p>C2: Understand the potential use of digital content in order to reinforce the marketing and other opportunities in agribusiness <u>EC - Knowledge:</u> EC 2.1. Digital content creation in agribusiness: case studies EC 2.2. Digital tools for personal productivity—digital content development <u>EC - Skills</u> EC 2.3. Identify the large market technologies and their main characteristics (use, requirements, costs) EC 2.4. Identify the possible risks, their impact, and the security requirements EC 2.5. Use autonomously the principal digital tools for digital content creation</p>	<p>1. Digital tools and content in agribusiness According to EC 1.1 – EC 1.4, EC 2.1</p> <ul style="list-style-type: none"> • Background to the use of digital content in agribusiness. • Essential types of multimedia sources: <ul style="list-style-type: none"> ○ Image formats ○ Sound formats ○ Video formats ○ Other multimedia and data formats • Multimedia sectors in the agrobusiness. • Methods of digital content creation: <ul style="list-style-type: none"> ○ Graphic design ○ Work with sound ○ Video processing ○ Management of additional multimedia data <p>2. Development of digital content According to EC 2.2 – EC 2.5</p> <ul style="list-style-type: none"> • Software for multimedia and digital content development. • Tools in agribusiness. • Integration between multimedia sources and content. • Strategic and operative decision making: <ul style="list-style-type: none"> ○ Influence of social media ○ Needs of the agribusiness market ○ Possible risks and impact analysis 	<p>1. The trainer, through an expository methodology, will provide an overview of the means of digital content use in agribusiness with detailed information about multimedia sources and methods about their integration in agribusiness. According to EC 1.1, EC 1.2</p> <p>2. Students, based on an expository explanation of a case study, will be able to identify potential fields for improvement in the field of digital tools in crucial sectors. After the case study, competence will be assessed through a structured test. According to EC 1.3, EC 1.4, EC 1.5</p> <p>3. The trainer, through a demonstrative method, will explain the most used software and tools for multimedia and digital content development. The students will become familiar with the most effective methods of multimedia content handling. According to EC 2.1</p> <p>4. The trainer, through a tutorial method, will describe to the students how they can identify their market and design suitable digital and multimedia content for it. Competence will be assessed asking to the students to create digital content using online software for image or video production. According to EC 2.4</p>		

3.4 Problem solving

COMPETENCE UNIT	B.4 Identifying needs, technological responses and digital competences gap		Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Analyze the strategic orientation and digital needs of agribusiness firms <u>EC - Knowledge:</u> EC 1.1. Influence of digital resources on agribusiness EC 1.2. State of the use of digital resources in agribusiness EC 1.3. Digital needs analysis: methods and techniques <u>EC - Skills</u> EC 1.4. Moving from a digital firm strategy, analyze the existing state, in terms of technological, organizational, and professional resources</p> <p>C2: Recognize the technological and the professional needs, both in terms of kind of resources and investment costs <u>EC - Knowledge:</u> EC 2.1. Strategic orientation of agribusiness firms towards digital technologies EC 2.2. Investment costs and expected ROI feasibility study methods and techniques <u>EC - Skills</u> EC 2.3. Identify and explain the principal needs, in an economic perspective EC 2.4. Carry out feasibility studies EC 2.5. Explain the economic perspective for moving to a digital strategy EC 2.6. Identify the various strategic alternatives available for use of digital resources EC 2.7. Review and develop the digital competence and performance of others EC 2.8. Support the firm’s decision makers and exercise guidance and supervision of the decision-making process</p>	<p>1. Strategic orientation in agribusiness According to EC 1.1 – EC 1.4</p> <ul style="list-style-type: none"> • Current situation in agribusiness firms. • Methods and techniques for digital needs analysis: <ul style="list-style-type: none"> ○ Different types of strategic orientation ○ Identification of strategic alternatives ○ Strategic directions ○ Strategic management • Digital resources and opportunities in agribusiness firms <ul style="list-style-type: none"> ○ Types of resources and opportunities ○ Gaps in digital competences and their reduction <p>2. Technological and professional needs in digital firm strategies for agribusiness According to EC 2.1 – EC 2.8</p> <ul style="list-style-type: none"> • Technological Innovation Process • Economic perspectives to the application of digital needs <ul style="list-style-type: none"> ○ Investment cost calculation ○ Return on investment study ○ Risk analysis ○ Managing of financial risks in agribusiness ○ Financial risk modelling • Feasibility studies • Methods to explain to decision-makers 	<p>1. The trainer, through an expository methodology, will explain the current state of the agribusiness firms in terms of their digital needs. After this explanation, the trainer will provide an overview of the methods and techniques for a digital needs analysis. According to EC 1.1 – EC 1.3</p> <p>2. Students, through a case study, will be able to analyze the current state of technological and digital resources of an agribusiness firm. From the gained information, they will be able to define their strategic orientation. According to EC 1.4, EC 1.5</p> <p>3. The trainer, through an interrogation method, will explain the available strategic alternatives for the use of digital resources and filling gaps in the firms. According to EC 2.1</p> <p>4. The trainer, through a tutorial method, will explain the methods of managing financial risks, their modelling in agribusiness firms, and methods and techniques for feasibility study including the economic calculation of investment cost. According to EC 2.2, EC 2.3, EC 2.4, EC 2.5</p> <p>5. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on a case described by the trainer and the data in their possession, will analyze a proposed company and carry out a feasibility strategy for its transition towards a more integrated approach to digital technologies. According to EC 2.4, EC 2.5</p>		

3.5 Learning Assessment of AREA B

TRAINING MODULE			
	COMPETENCE UNIT	ACTIVITIES AND EVALUATION TOOLS	
CORE – Digital	B1 - Evaluating and managing data, information and digital content in the agribusiness	C1. Project work: creation of a data model system based on instructions given by the teachers	
		C2. Project work: design of a simple database (Access)	
	B2 - Interacting, sharing and collaborating through digital technologies in the agribusiness	C1. Group work: case study assessment with instructions from the trainer	
		C2. Analysis of a concrete problem in the company and propose a solution based on the application of digital tools	
	B3 - Developing digital content in agribusiness	C1. Multiple choice quiz	
		C2. Production of creative digital content	
	B4 - Identifying needs, technological responses and digital competences gap	C1. Group work: case study assessment with instructions from the trainer	
		C2. Simulation of a feasibility study	
			FINAL TEST OF THE TRAINING MODULE (theoretical and practical)
			WORK BASED LEARNING Feasibility study for the digitalization of an agricultural firm, including the elaboration of procedural, operational and financial reports and action plans.

4 CORE – Innovation

4.1 Foundations

COMPETENCE UNIT	C.1 Innovation as economic, technological, and cultural process: framework		Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Understand the key factors (enablers or hindrances) of (digital) innovation, seen through a multi-dimensional perspective, integrating economic, technological and cultural aspects, in order to define an effective approach towards the firms operating in agribusiness</p> <p><u>EC - Knowledge:</u> EC 1.1. Foundations of the innovation processes, in their economic, technological, social, professional and cultural aspects. EC 1.2. Agricultural specificities: grafting immaterial (digital) values into a deep material, analogical culture EC 1.3. Kinds, roles and behaviors of “innovation agents” EC 1.4. Innovation in rural development EC 1.5. Innovation as a process: incrementalism vs turnaround approaches</p> <p><u>EC - Skills</u> EC 1.6. Understand the complex nature of the (digital) innovation EC 1.7. Characterize the firm/context in terms of willingness to innovate EC 1.8. Detect the enabling/hindering factors EC 1.9. Define a sustainable approach to innovation EC 1.10. Act coherently towards the firm and the stakeholder, assuming the useful behavior</p>	<p>1. AGRIBUSINESS DIGITAL TRANSFORMATION: key factors (enablers and hindrances) of digital innovation According to EC 1.1 – EC 1.10</p> <ul style="list-style-type: none"> - An overview: the agribusiness system between innovation and tradition - Economic and practical advantages of innovation - Sustainability and environmental protection with a view to innovation - Policies and tools for innovation in agribusiness considering new European programming - Innovation in rural development (generate and disseminate) - Competitive growth factors and innovation - The importance of development services for the diffusion of innovation - Competitive growth factors and innovation - The importance of development services for the diffusion of innovation - Competitive development through networking - International trade in the sector, digital innovation and e-commerce 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology, will provide an overview of the agribusiness system. This will be supported by written materials and videos According to EC 1.1 – EC 1.4 2. The trainer will provide various successful experiences regarding digital transformation in agribusiness (supported by written materials and/or videos). The students will be divided into working groups to discuss the proposed examples. Each group will have to present a case study by exposing the key factors. Afterwards, the trainer will provide feedback to clarify any doubts. EC 1.5 – EC 1.10 3. The trainer, through active methods, will allow the students to discover possibilities of strategic decision making. The students will also discuss their points of view concerning market needs and possible solutions to fulfil them. According to EC 1.5 – EC 1.10 		

4.2 Digital transformation

COMPETENCE UNIT	C.2 Digital transformation: enabling technologies, key drivers, and their impacts		Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Understand characteristics, drivers, and impact of digital transformation and KET in the agricultural sector. EC - Knowledge: EC 1.1. Digital transformation main characteristics: disruptive innovation vs incremental innovation EC 1.2. Digital transformation key drivers: technology availability, digital-human interfaces, costs EC 1.3. Digital transformation markets: demand, supply, competitive factors EC 1.4. Reference sources EC 1.5. Methods and techniques for digital technology markets EC - Skills EC 1.6. Understand the main digital technologies trends EC 1.7. Analysis and monitoring of digital technology markets and identification of the emerging technologies coherent with the agribusiness sector EC 1.8. Identify the enabling technologies and their potential applications in the agrobusiness sector EC 1.9. Characterize the enabling technologies in terms of constraints and opportunities</p>	<p>1. Impact of the digital transformation According to EC 1.2 – EC 1.9</p> <ul style="list-style-type: none"> • Farming and agricultural process digitalization • Effects of enabling technologies on processes, products, and the business model. • Simulation scenario to analyze the impact of the technologies and their benefits. • Accessibility study depending on the dimensions and typology of the product. <p>2. KET (Key Enabling Technologies) in agricultural sector According to EC 1.1, EC 1.4, EC 1.5, EC 1.6, EC 1.9</p> <ul style="list-style-type: none"> • The Cloud • Sensing (drones, satellites, etc.) • GIS • GPS, Galileo and Copernicus • Big Data, Analytics and Machine Learning • Internet of things. • Augmented and Virtual reality. • Cybersecurity • Elements of big data platforms • Elements of agricultural machines and practical actuators: tractors, innovative tools, etc • 5G and broadband communications networks <p>3. Digital Business Models According to EC 1.2 – EC 1.8</p> <ul style="list-style-type: none"> • The new business models of the digital age • Features and transformations in new business environments • Administrative management, and communication and coordination with administration and authorities 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology, will provide the students with information about Key Enabling Technologies and focus on their application in the agricultural sector, explaining cases of success and main problems they face. This will be supported by written materials and videos. According to EC 1.1 – EC 1.3 2. The trainer, through an expository methodology will provide the students with information about Digital Business Models and the process of digitalization. This will be supported by written materials and videos. According to EC 1.1 – EC 1.4. 3. The trainer, through an interrogative methodology, will individually formulate direct questions based on KET and Digital Business Models. According to EC 1.1 – EC 1.4. 4. Students, in groups and based on a business study will analyze the digitalization status of the business, identifying and evaluate the problems and opportunities, and integrating new enabling technologies. They will develop a road map to digitize the business model and processes. Then they will detect the enabling/hindering factors, and define an effective approach to the innovation. After this analysis, there will be a sharing of the groups, feedback from the trainer and clarification of doubts. According to EC 1.4 – EC 1.8 5. The trainer, through an expository methodology, will give students an overview about the evolution and development of European research and innovation funds. Competence will be assessed through group-based work where students will get access and work with open administrative data. According to EC 1.4 – EC 1.8 		

4.3 Feasibility study and project management

COMPETENCE UNIT	C.3 Digital transformation: feasibility study and innovation management		Duration	3-4 ECTS 100/120 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Apply a SWOT Analysis methodology to the digital innovation in the agribusiness, with a specific focus to the SMEs, in order to design a sustainable and rewarding approach to strategic and operational application</p> <p><u>EC - Knowledge:</u> EC 1.1. Feasibility study: relevant methods coherent with the agribusiness specificities EC 1.2. In depth: SWOT analysis methods and their tools EC 1.3. Typical SWOT analysis variables applied to the agribusiness digital transformation EC 1.4. Project life cycle EC 1.5. Project management methods and techniques EC 1.6. Digital tools supporting project management</p> <p><u>EC - Skills</u> EC 1.7. Specify and apply the SWOT analysis method in order to its application to the agribusiness digital transformation EC 1.8. Perform the SWOT analysis and report results coherently with the needs and capabilities of the interested firm EC 1.9. On the basis of the SWOT analysis results, plan the innovation project EC 1.10. Manage the project and control its progressive implementation EC 1.11. Revise periodically the project plan EC 1.12. Report the state of advance to firm's decision makers EC 1.13. Review and develop digital competence and performance of others</p>	<ol style="list-style-type: none"> 1. SWOT analysis as a strategic planning tool According to EC 1.1, EC 1.2, EC 1.3, EC 1.4, EC 1.5, EC 1.6 <ul style="list-style-type: none"> • Strengths and weaknesses • Opportunities and threats • When to conduct a SWOT analysis • How to conduct a SWOT analysis • What will SWOT analysis achieve? • SWOT analysis examples 2. The identification of internal and external factors (quantitative and qualitative data) According to EC 1.1, EC 1.2, EC 1.3, EC 1.4, EC 1.5, EC 1.6 <ul style="list-style-type: none"> • Key issues in a mixed-methods approach • Site and household selection • Data analysis and integration 3. Selecting possible actions and monitoring success compared to the context According to EC 1.1, EC 1.2, EC 1.3, EC 1.4, EC 1.5, EC 1.6 <ul style="list-style-type: none"> • Change management • Complex Thinking • Capacity building and training 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology, will provide the basis to best apply a SWOT analysis. According to EC 1.1, EC 1.2, EC 1.3 2. The trainer will provide various examples of SWOT Analysis to demonstrate the identification – especially in the digital sector – of needs for stimulating innovation, cooperation, and business development. According to EC 1.4, EC 1.5, EC 1.6 3. The trainer, through active methods, will enable the students to discover that strategic decisions can be taken (on a digital basis: from selecting actions to monitoring success) According to EC 1.4, EC 1.5, EC 1.6 		

4.4 Change management

COMPETENCE UNIT	C.4 Organization and Human Resources Management drivers and enablers	Duration	5 ECTS 150 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Understand how human factors and technological and operational change are intertwined, and stimulate collective learning and cultural change EC - Knowledge: EC 1.1. Cognitive and cultural bias obstacles to the innovation EC 1.2. Innovation as a learning process EC 1.3. Elements of cultural analysis EC 1.4. Professional and training needs analysis: methods and techniques EC 1.5. Change design and change management: methods and tools EC 1.6. Team building and collaborative environments: methods and techniques EC 1.7. Bargaining and conflict avoidance/resolution techniques EC - Skills EC 1.7. Analyze firms' structures identifying roles and responsibilities EC 1.8. Identify forms of intervention in collective situations, analyzing the process of decision making, that leads to them EC 1.9. Identify and value learning opportunities and their relationships with the world, analyzing market offers and demand in order to maintain a culture of updating and innovation EC 1.10. Support team building, collaboration, and cooperation schemes EC 1.11. Review and develop digital competence and the performance of others</p>	<p>1. People as a key element in business digitalization According to EC 1.1, EC 1.2</p> <ul style="list-style-type: none"> • People and digitalization • Skills for work in the digital age • Continuous training to adapt to future changes. • New soft skills to develop in human resources. <p>2. Human Resources Management in digitalization According to EC 1.1 – EC 1.3, EC 1.6, EC 1.8 – EC 1.11</p> <ul style="list-style-type: none"> • New ways of leading teams in the digital age • New ways of working • Knowledge management • Talent Management in the new Organization Models • Management of high-performance teams. • Corporate culture <p>3. Team Building and collaborative working techniques According to EC 1.4, EC 1.6, EC 1.8, EC 1.10</p> <ul style="list-style-type: none"> • Characteristics of high-performance teams and taking advantage of synergies • Introduction to teamwork and its potential in new forms of work organization • Development towards high performance teams: features to achieve • Group dynamics and development • Development phases of working groups • Group dynamics and observation • Communication skills in teams • Simulation of group dynamics and teamwork • Communication techniques <p>4. Conflicts management: avoiding and solving According to EC 1.5</p> <ul style="list-style-type: none"> • Non-verbal language in relationships. • Social styles of behavior. • Key aspects that determine the outcome of good personal relationships. <ul style="list-style-type: none"> ○ The first approach 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology will provide the students with information about the role of human resources in digitalization, training needs and techniques to foster a collaborative environment and conflict management. This will be supported by written materials, cases of study and videos. According to EC 1.1 – EC 1.5 2. Students, in groups, and based on case studies will determine a training plan for each role in the company, and select and determine the implementation process to solve a specific conflict in order to create a more collaborative environment. The trainer will provide the case study with objectives, and data in each case study. After this analysis, there will be a sharing of the group outcomes, feedback from the trainer and clarification of doubts. According to EC 1.6 – EC 1.11 3. Students in groups will do a dynamic role-playing exercise to put into practice team building and conflict management techniques. At the end of the exercise, the trainer will give the feedback to the group dynamic and students will mutually exchange their views in peer evaluation. According to EC 1.1 – EC 1.4, EC 1.7 – EC 1.11 	

	<ul style="list-style-type: none">○ Prejudices that condition the behavior of relationships○ Listening○ Empathy○ Emotional control○ Assertiveness• Strategies to gain cooperation and influence• Generative conflict and dialectic	
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4.5 Learning Assessment of AREA C

TRAINING MODULE		
	COMPETENCE UNIT	ACTIVITIES AND EVALUATION TOOLS
CORE – Innovation	C1 - Innovation as an economic, technological, and cultural process: framework	C1. Theoretical exam: 3 Short questions and definitions Evaluation: if they identified the knowledge and concepts explained at class.
	C2 - Digital transformation: enabling technologies, key drivers, and their impacts	C1. Theoretical exam: 1. Short questions and definitions 2. Given a business innovation case (7 line description): a. identify the phases of the innovation b. identify technologies or innovative strategies used c. describe if these technologies have had any impact on or benefit to the company/farmer. Evaluation: whether they identified the knowledge and concepts explained at class.
	C3 - Digital transformation: feasibility study and innovation management	C1. Management of ICT tools: SWOT, Blue Oceans, problem solving... working in groups. Presentation of the results on the use of these tools. Objective evaluation. Evaluation method: <ul style="list-style-type: none"> • how they express and communicate their results (verbal and non-verbal language). • if the presentation sequence is logical. • oral expression • evaluation of the supporting material (if they are of new technologies, if they have been innovative, creativeness)
	C4 - Organization and Human Resources Management drivers and enablers	C1. Role play: one/two will act as Farmers and one/two act as advisors (groups of three). Defining a case where the advisor has to sell an idea or an innovative App and the Farmer has some questions/concerns. Evaluation methods: <ul style="list-style-type: none"> • communication tools used • technologies used • strategies to convince and solve problems • synergies generated
		FINAL TEST OF THE TRAINING MODULE (theoretical and practical)
		ASSESSMENT OF EVALUATION OPPORTUNITIES. Divide the class in two groups that has different needs but they share some commonalities. Each group doesn't know the necessities of the other one and then they have to do a role play where the teacher will evaluate if they identify synergies and use them to get to an agreement.

5 Domain Application

5.1 Strategic planning and sustainable management

COMPETENCE UNIT	D.1 Sustainable key concepts		Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Describe the sustainable principles <u>EC - Knowledge:</u> EC 1.1 Know what is meant by the sustainability concept EC 1.2 Identify the SDG's and their targets <u>EC - Skills</u> EC 1.3 Identify the impacts of the digital strategies in terms of sustainable development goals and their targets</p> <p>C2: Describe the integration of sustainability and circular economy principles in an agribusiness value-chain <u>EC - Knowledge:</u> EC 2.1 Describe circular economy EC 2.2. Describe schemes and cases of integration between agriculture and industry EC 2.3 Indicate the digital contribution of sustainability and circular economy schemes <u>EC - Skills</u> EC 2.4 Develop a circular economy approach, within and between firms, following a value-chain approach EC 2.5. Ensure the sustainability principles are used as a reference paradigm to analyze and develop agribusiness EC 2.6 Identify the possible sustainability trade-offs between single innovative actions and optimize, with a systemic and integrated view, the innovation process</p>	<p>1. Sustainable principles. According to EC 1.1 – 1.4</p> <ul style="list-style-type: none"> ● Sustainability concept ● UN Agenda 2030 framework <ul style="list-style-type: none"> ○ SDGs ○ Targets of the SDGs ● Theory of Socio-Technical Transitions to Sustainability <p>2. Sustainability and circular economy in agriculture. According to EC 2.1 – EC 2.6</p> <ul style="list-style-type: none"> ● Define circular economy ● Schemes and cases of integration, e.g. <ul style="list-style-type: none"> ○ Agrocycle ● Digital contribution to the sustainability and circular economy schemes: e.g., potential solutions for <ul style="list-style-type: none"> ○ the production stage ○ the consumption stage ○ food waste and surplus ○ management and prevention 	<p>1 The trainer will introduce principles of sustainable development. Students will become familiar with knowledge of the SDGs and the theory of socio-technical transition to sustainability. According to EC 1.1, EC 1.2</p> <p>2 Students will – with the acquired knowledge - identify the impacts of digital strategies in terms of sustainable development goals and their targets. According to EC 1.3</p> <p>3 The trainer will provide the students with examples of schemes and cases of integration of sustainability and circular economy in an agribusiness value-chain. According to EC 2.1, EC 2.2</p> <p>4 Students will – using an existing farm as an example – develop a circular approach, assuming the sustainability principles as a reference paradigm, identifying the possible sustainability trade-offs between single innovative actions and optimizing the innovation process. According to EC 2.3 – EC 2.6</p>		

COMPETENCE UNIT	D.2 Strategy, Data and Decision Support Systems	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Orient and support the agricultural firm in defining and applying, from a value-chain perspective, its digital strategy, using and valorizing its data, identifying the appropriate Decision Support Systems EC - Knowledge: EC 1.1. Digital strategies applied to agribusiness: main trends and case studies EC 1.2. Strategic analysis of the agribusiness firm: systemic approach and benchmarking techniques EC 1.3. Decision Support Systems applied to agribusiness EC - Skills EC 1.4. Analyze the firm's positioning toward its real and potential market and the digital innovation trends of the sector EC 1.5. Analyze sources of information and business ideas, comparing their advantages and disadvantages EC 1.6. Apply creativity techniques in generating ideas of digitalization EC 1.7. Analyze the coherence between economic environmental, strategic, and structural factors (organization, processes, resources) EC 1.8. Apply creativity techniques in generating ideas for a firm's digitalization EC 1.9. Evaluate work activities in the productive process, identifying their contribution to the overall process and their impacts on digital transformation EC 1.10. Recognize business opportunities given by the digital transformation EC 1.11. Identify a suitable Decision Support System EC 1.12. Support firm's decisions makers in applying a Decision Support System in order to evaluate digital transformation scenarios, identifying and gather the appropriate data EC 1.13. Determine the economic-financial viability of different business digitalization ideas</p>	<p>1. Analysis of digitalization opportunities of the company According to EC 1.1 – EC 1.13</p> <ul style="list-style-type: none"> ● Identification of opportunities and business ideas. <ul style="list-style-type: none"> ○ Needs and trends. ○ Digital strategies applied to the agribusiness: main trends and case studies ○ Search sources. ○ Curiosity as a source of value and search for opportunities. ○ Creativity techniques in the generation of ideas. ○ Mind maps. ● SWOT analysis of company's digitalization opportunities <ul style="list-style-type: none"> ○ Utility and limitations. ○ Structure: Weaknesses, Threats, Strengths, Opportunities. ○ Preparation of SWOT. ○ SWOT interpretation. ● Strategic analysis of the agribusiness firm: systemic approach and benchmarking techniques ● Decision Support Systems applied to agribusiness ● Analysis of the digital environment of the company. <ul style="list-style-type: none"> ○ Choice of information sources. ○ Market segmentation. ○ Productive decentralization as a rationalization strategy. ○ Outsourcing services ○ Competition. ○ Entry barriers. ● Analysis of previous decisions. <ul style="list-style-type: none"> ○ Objectives and goals. ○ Business mission. ○ Administrative procedures: licenses, permits, regulations and others. ○ Business vision. ● Action plan. <ul style="list-style-type: none"> ○ Investment needs forecast. ○ Product / Service differentiation. <p>2. New organizational models According to EC 1.7 – EC 1.13</p> <ul style="list-style-type: none"> ● Organizational models in digitalized agribusiness ● Decentralization of decision making. ● Analysis of the value chain: 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology will present digital strategies applied in agribusiness, trends, search engines and benchmarking and creativity techniques. According to EC 1.1 – EC 1.3, EC 1.7 2. The trainer, through an expository methodology will describe new organizational models in digitalization, the process to undertake the digitalization of a company using Decision Support System. According to EC 1.8 – EC 1.13 3. Based on a practical, the students in groups will characterize business opportunities related to agribusiness digitalization: <ul style="list-style-type: none"> - Generate business ideas through creativity techniques, prioritizing them based on feasibility criteria. - Locate the information related to each idea presented and identify potential customers, suppliers using the tools available. - Establish the main opportunities and threats offered by the market defined after segmentation identifying the differentiating factors of every idea presented. - Perform a SWOT with the analyzed variables - strengths and weaknesses of the entrepreneur, opportunities and threats of the environment - Select the most appropriate business idea for the development of a plan business based on the SWOT analysis chart justifying the decision. According to EC 1.1 – EC 1.13 	

	<ul style="list-style-type: none">● Definition of the value chain and its usefulness in the search for competitive advantage.● Importance of the organizational model as a source of value and the search for synergies.● Real cases of value generation through organizational changes within the company.● Measurement of human and mechanical resources● Generalized application of sensors in the company to obtain data on the performance of people and machines● Introduction to biometrics.● Models of organizational performance measurement.	
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5.2 Precision agriculture

COMPETENCE UNIT	D.3 Data sensors: platforms (drones and satellites) and agronomic sensors	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1 Determine the characteristics and usefulness of the different sensor platforms <u>EC - Knowledge:</u> EC 1.1. Unmanned observation systems and their technological characteristics: satellites, planes, drones, agronomic sensors (e.g. sensors applied to agricultural machinery; soli sensors) <u>EC - Skills</u> EC 1.2. Understand operational principles of the different unmanned observation systems</p> <p>C2 Determine suitable unmanned observation systems in precision agriculture <u>EC 2 – Knowledge:</u> EC 2.1 Precision agriculture applications: analysis of plant health (e.g. NDVI); plant photosynthetic activity (e.g. TCARI/OSAVI); water and nitrogen uptake (e.g. NDMI, NMDI); canopy status; superficial water outflow and drainage; hydrogeological risk; crop anomalies (historical indices); logistical planning. EC 2.2. Costs of unmanned observation systems <u>EC - Skills</u> EC 2.3. Understand costs, risks, and opportunities in precision agriculture applications. EC 2.4. Identify existing models and applications and characterize them in terms of goals, requirements, and costs EC 2.5. Compare the usefulness of the different unmanned observation systems from their characteristics EC 2.6. Carry out feasibility studies, identifying the main characteristics of the unmanned observation systems coherent with the agricultural contexts, using a SWOT analysis approach EC 2.7. Identify a suitable unmanned observation system and its application suite</p>	<p>1. Unmanned observation systems (UOS) According to EC 1.1 – 1.2</p> <ul style="list-style-type: none"> • Description of the different unmanned aerial systems: <ul style="list-style-type: none"> ○ Satellite ○ Planes ○ Drones ○ Agronomic sensors e.g. <ul style="list-style-type: none"> ▪ sensors applied to agricultural machines ▪ soil sensors • SWOT analysis of the different systems <ul style="list-style-type: none"> ○ technological characteristics ○ regulation (limitations) ○ costs <p>2. UOS in precision agriculture According to EC 2.1 – 2.9</p> <ul style="list-style-type: none"> • Precision agriculture applications, such as: <ul style="list-style-type: none"> ○ Analysis of plant health (eg. NDVI); ○ Plant photosynthetic activity (eg. TCARI/OSAVI) ○ Water and nitrogen uptake (eg. NDMI, NMDI); ○ Canopy status; ○ Superficial water outflow and drainage. ○ Hydrogeological risk; ○ Crop anomalies;(historical of indexes) ○ Logistical planning; • SWOT analysis of the different UOS <ul style="list-style-type: none"> ○ Cost versus application according to needs • Typical applications in agribusiness processes: <ul style="list-style-type: none"> ○ Logistics, ○ Resources, ○ Constraints, ○ Costs, ○ Generated value ○ Return on investment 	<p>1. The trainer, through an expository methodology, will provide students with information about different UOS, their technological characteristics, regulation, and costs. This will be supported by written materials and presentation. According to EC 1.1, EC 1.2</p> <p>2. Students will classify the different UOS via their characteristics and operational costs into relative usefulness. According to EC 1.1, EC 1.2</p> <p>3. The trainer, through an expository methodology, will provide students with information about the different precision agriculture applications for UOS. This will be supported by written materials and presentations According to EC 2.1</p> <p>4. Students, based on a case study of a Company willing to use drones, will carry out a feasibility study, plan the drone applications and develop a road map and support the firm in its application, using project management techniques The conclusions of students will be gathered in presentation form According to EC 2.2 – 2.9</p>	

<p>EC 2.8. Evaluate costs and appraise foreseen impacts EC 2.9. Develop a road map and support the firm in its application, using project management techniques</p>		
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COMPETENCE UNIT	D.4 Using data: GIS and data modelling	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Describe the basic principles of GIS <u>EC - Knowledge:</u> EC 1.1. Principles, concepts, development, and technologies of topography and photogrammetry EC 1.2. Geographical coordinate systems and projection (WGS1984 Auxiliary Sphere; ETRS 1989; National datum) EC 1.3. Foundations of Geographical Information Systems (GIS), georeferencing techniques and location determination EC 1.4. Cartography, photogrammetry, geographic information systems and remote sensing in agronomy: Topography, Weather, Vegetation analysis, Soil study (nutrients, texture etc.) EC 1.5. Large public cartographic databases and their WEB repositories. LIDAR DTM; satellite images. EC 1.6. Techniques of acquisition, processing, and integrating cartographic, positioning, and Geophysical, Agronomic and Forest data <u>EC - Skills</u> EC 1.7. Understand and use the principles of cartography and visualization and apply them to the production and interpretation of maps and the visualization of georeferenced information EC 1.8. Gather, process, and interpret georeferenced information C2: Use GIS and cartography with data in agribusiness <u>EC - Knowledge</u></p>	<p>1. Basic principles of GIS According to EC 1.1 – 1.8</p> <ul style="list-style-type: none"> ○ The structure of a GIS user interface ○ Exploring geodata <ul style="list-style-type: none"> ○ Loading of vector and raster data ○ Basic Operations ○ Online data, e.g. <ul style="list-style-type: none"> ▪ Working with large public cartographic databases and their Web repositories ▪ LIDAR DTM ▪ satellite images (like Sentinel2) ○ Adding own (collected) data ○ Visualize data and cartographic options ○ Creating data sets ○ Working with geographical coordinate systems and projections <ul style="list-style-type: none"> ○ WGS1984 Auxiliary sphere ○ ETRS 1989 ○ National datum ○ Requesting data: attribute queries and spatial queries ○ Geographic analysis options ○ Georeferencing techniques <p>2. Use GIS and cartography with data in smart farming According to EC 2.1 – EC 2.4</p> <ul style="list-style-type: none"> ● GIS in agronomy <ul style="list-style-type: none"> ○ Topography ○ Weather ○ Vegetation analysis, ○ Soil study e.g. <ul style="list-style-type: none"> ▪ Soil nutrients ▪ Soil texture ● GIS applications to control and automate the navigation systems of agricultural machinery 	<p>1. Students will work hands-on in a guided exercise - using a GIS platform - whereby they execute all essential GIS-skill. This will be supported by a practical (online) manual explaining all techniques. According to EC 1.1 – EC 1.4</p> <p>2. Students will apply the GIS knowledge and skills working hands-on with real data to analyze an existing farmland and as a result create a diagnostical map on the quality of the field with recommendations on the results. According to EC 2.1 – EC 2.4</p> <p>3. The trainer, through an expository methodology, will describe the application of data modelling in precision agriculture processes, considering goals requirements and costs. This will be supported by written materials and a presentation. According to EC 3.1-3.2</p> <p>4. The students will - using the diagnostical map (C2) & adding other data - analyze the firm's needs, identify sustainable practice, and analyze the costs. The conclusions of students will be gathered in presentation form. According to EC 3.3 - EC 3.8</p>	

<p>EC 2.1. Transmission and process data techniques in agricultural machine automation</p> <p>EC 2.2 Costs of the GIS applied to agronomy</p> <p><u>EC - Skills</u></p> <p>EC 2.3. Carry out thematic cartographies with Geographic Information Systems functional to precision agriculture</p> <p>EC 2.4. Use GIS applications to control and automate the navigation systems of agricultural machinery</p> <p>C3: Use of data modelling in smart agriculture</p> <p><u>EC - Knowledge</u></p> <p>EC 3.1 Data modelling principles: basic statistics, data mining, data representations</p> <p>EC 3.2 Analysis forecast model</p> <p><u>EC - Skills</u></p> <p>EC 3.3. Use large georeferenced databases of dynamic information from sensor networks to analyze and spatially visualize data together with its time dependence</p> <p>EC 3.4. Characterize data (potentially) available, their reliability and their consistency from a medium-long term perspective</p> <p>EC 3.5. Characterize digital resource availability and users' skill state</p> <p>EC 3.6. Define data integration goals, identify suitable model/techniques, data acquisition process and quality control protocols</p> <p>EC 3.7. Evaluate costs and appraise their foreseen impacts</p> <p>EC 3.8. Develop a roadmap and support the firm in its application, using project management techniques</p>	<p>3. Data modelling in smart agriculture</p> <p>According to EC 3.1 – EC 3.8</p> <ul style="list-style-type: none"> ● Data modelling principles <ul style="list-style-type: none"> ○ basic statistics ○ data mining ○ data representations ● Analysis forecast model ● Comparisons with other data ● Added value for agribusiness needs ● Deal with costs 	
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COMPETENCE UNIT	D.5 Agronomic resource management		Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Describe the main principles of agronomic resource management <u>EC - Knowledge:</u> EC 1.1. Methods and techniques of optimization: state-of-the-art EC 1.2. Methods and techniques of efficiency audit: energy, water, soil, seeds and plants; fertilizers, machines, human labor factors EC 1.3. Differences between Quality Assurance and Quality Control EC 1.4. Quality Assurance tools and techniques; cost-benefit analysis; costs of quality; control charts; benchmarking; design of experiments; statistical sampling <u>EC - Skills</u> EC 1.5. Analyze productive processes, characterizing the inherent operations to the process, equipment, facilities, and resources available to plan them. EC 1.6. Identify efficiency goals, productive factors involved and the digital contribution to their achievement EC 1.7. Define possible digital actions EC 1.8. Evaluate costs and appraise foreseen impacts EC 1.9. Develop a roadmap and support the firm in its application, using project management techniques</p>	<p>1. Agronomic resource management According to EC 1.1, EC 1.2</p> <ul style="list-style-type: none"> • land • water • soil • seed & plants • animals <p>2. Methods and techniques of optimization According to EC 1.3, EC 1.4</p> <ul style="list-style-type: none"> • Quality Assurance and Quality control <ul style="list-style-type: none"> ○ Difference between quality assurance & quality control ○ Quality Assurance Tools & Techniques <ul style="list-style-type: none"> ▪ Cost-Benefit Analysis ▪ Cost of Quality ▪ Control Charts ▪ Benchmarking ▪ Design of Experiments ▪ Statistical Sampling <p>3. Productive processes analysis According to EC 1.5 – EC 1.9</p> <ul style="list-style-type: none"> • Productive processes analysis <ul style="list-style-type: none"> ○ Equipment ○ Facilities ○ Resource evaluation ○ Planning • Goal identification <ul style="list-style-type: none"> ○ Digital contribution evaluation ○ Costs and impacts analysis • Roadmap development 	<p>1. The trainer will introduce new strategic ideas of integrated logistics through a problem-based learning methodology. Students will become familiar with knowledge and skills in the area of agronomic resources management, as well as how optimization can be done taking into account quality assurance and control. This will be supported by written materials and presentation. According to EC 1.1 – 1-4</p> <p>2. This strategy uses active learning leveraging a problem-based learning methodology. Students, based on a case described by the teacher and the data in their possession, will analyze a proposed company during a debate moderated by the teacher. According to EC 1.5 – 1-9</p>		

5.3 Agrifood and value add services

COMPETENCE UNIT	D.6 Integrated logistics	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Describe the main principles and concepts related to logistics management in agriculture <u>EC - Knowledge:</u> EC 1.1. Integrated logistics and supply chain management definition. Objectives of integrated logistics management, logistics services and costs EC 1.2. Strategic role of integrated logistics in terms of competitiveness EC 1.3. Basic principles of integrated logistics management EC 1.4. Theory of production and quantitative analysis of costs. EC 1.5. Physical and digital integration and actor coordination: production planning, use of common productive factors, traceability, logistics, stock optimization; transactional costs reduction <u>EC – Skills</u> EC 1.6. Analyze the sector's structure, finding the value chain segments potentially interested in physical and digital integration EC 1.7. Recognize the logistical process, identifying its phases and documentation associated for planning in the food industry/company EC 1.8. Identify potential models of integration at the value chain level and characterize them in terms of value added, expected, requirements and costs</p> <p>C2: To propose suitable tools and methods for implementation of integrated logistics in specific conditions. <u>EC - Knowledge:</u> EC 2.1. Procurement and its principles. Plan procurement logistics. Management of procurement and logistics activities EC 2.2. Implementation of inventory management systems in agricultural enterprises EC 2.3. Reasons for the development of integrated logistics in agriculture.</p>	<p>1. Integrated logistics and its management. According to EC 1.1 – EC 1.8</p> <ul style="list-style-type: none"> • Definition, objectives and basic principles of integrated logistics management. • Development of integrated logistics management. • Logistic information system. • Materials flow and transport management. • Inventory management. • Elements of supply chain management performance. • Basic procurement/purchasing procedures. • Warehousing, material handling. • Market demand, forecasting techniques. <p>2. Integrated logistics management in agriculture. According to EC 2.1 – EC 2.12</p> <ul style="list-style-type: none"> • Reasons for the development of integrated logistics in agriculture. • Integrated logistics solutions in agricultural production. • Application of integrated logistics solutions in various types of agricultural production enterprises. • Theory of production and quantitative analyses of costs. • Factors to consider in the choice of logistic options for agribusiness. • Types of agricultural production and their impact on integrated logistics and design of implementation and evaluation of advantages and disadvantages with an emphasis on market economy. • The role of information and IT in the coordination of actors. • Develop a road map and support services in the supply chain. 	<p>According to EC 1.1 – EC 1.8: The trainer will introduce new strategic ideas of integrated logistics through a problem-based learning methodology. They will be familiar with knowledge and skills in the area of procurement, stores management, supply chain management, and logistics management (logistical system with cross-functional integration). Identification of market signals and align demand planning accordingly across the supply chain.</p> <p>According to EC 2.1 – EC 2.12: The trainer will provide the students with the competencies for research methodology and business management, statistical analysis, computer skills, technical and scientific report writing, competencies to use information management tools and methods. Appropriate statistical packages will be used in the course unit to demonstrate how to apply the techniques on real data.</p>	

<p>EC 2.4. Integrated logistics solutions in agricultural production.</p> <p>EC 2.5. Application of integrated logistics solutions in various types of agricultural production enterprises.</p> <p>EC 2.6. Factors to consider in the choice of logistics options for agribusiness.</p> <p>EC 2.7. Types of agricultural production and their impact on integrated logistics and design of implementation and evaluation of advantages and disadvantages with an emphasis on market economy.</p> <p><u>EC - Skills</u></p> <p>EC 2.8. Analyze needs and opportunities of the significant actors of (or segment of) the value chain</p> <p>EC 2.9. Support and advise involved actors in common strategic development, with a specific focus on digital aspects</p> <p>EC 2.10. Identify suitable model/techniques, data acquisition processes, and the quality control protocol</p> <p>EC 2.11. Evaluate costs and appraise foreseen impacts</p> <p>EC 2.12. Develop a roadmap and support the firm in their application, using project management techniques</p>		
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COMPETENCE UNIT	D.7 Traceability		Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES		
<p>C1: Identify the possible development paths of traceability potentially empowered / optimized by a digital approach <u>EC - Knowledge:</u> EC 1.1. Traceability norms and international standards in the agribusiness sector EC 1.2. Needs and methods of traceability in the value chain perspective EC 1.3. Technology of food monitoring and control: elements EC 1.4. Key information in traceability <u>EC – Skills</u> EC 1.5. Identify relevant norms and standards EC 1.6. Identify existing models and technological applications of traceability, and characterize them in terms of goals, requirements, and goals EC 1.7. Analyze the packaging, packing, and labelling operations, identifying the most important characteristics of materials and process techniques</p> <p>C2: To identify the kind of data and tools required, defining the road map and supporting digital implementation. EC 2.1. Digital aspects of traceability: traceability software and elements, database design, data acquisition, traceability queries EC 2.2. Blockchain logic, hardware and software requirement, applications, and costs EC 2.3. Packaging, labelling, and traceability <u>EC - Skills</u> EC 2.4. Analyze firm's needs and opportunities, following the supply chain logic EC 2.5. Evaluate costs and appraise foreseen impacts EC 2.6. Define suitable actions to implement/develop a high value-added traceability within and between firms EC 2.7. Develop a roadmap and support the firm in its application, using project management techniques</p>	<p>1. Traceability system <u>According to EC 1.1 – EC 1.7</u></p> <ul style="list-style-type: none"> • The components of a traceability system. • Needs and methods of traceability in an agriculture perspective. • Specific components of an agriculture traceability system. • Traceability and the importance of standards <p>2. Digital tools and roadmaps <u>According to EC 2.1 – EC 2.7</u></p> <ul style="list-style-type: none"> • Blockchain technology: Integrating information from the agriculture and food value chain • Traceability software and elements • Database Design • Data Acquisition • Traceability Query • Digital tools for packaging and labelling 	<p>According to EC 1.1, EC 1.2: The trainer, through an expository methodology, will provide an overview of what is meant by traceability for food and agricultural products, with the related legislation, norms, and international standards in place in some key markets regarding traceability requirements.</p> <p>According to EC 1.3, EC 2.1 – EC 2.7: The students, based on access and use of data along the value chain will be able to design a decision tree and traceability matrix. They will be familiar with the aspects of the traceability and possibilities to increase the transparency, efficiency and resilience of the food value chain.</p> <p>According to EC 2.1: The trainer will provide the students with the role of digital technologies in traceability and certification in agribusiness, kinds of traceability devices and basic principles of blockchain technologies.</p> <p>According to EC 2.3: The trainer, through a demonstrative methodology, will provide students with principles of database, data model, query design and a description of how they work and how they can be designed. This will be supported by demonstration of software for the design of a traceability system.</p>		

5.4 Digital marketing and e-commerce

COMPETENCE UNIT	D.8 Digital Marketing	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	CONTENT	METHODOLOGICAL STRATEGIES	
<p>C1: Obtain and process the information necessary for the definition of digital strategies and digital commercial actions, according to an organization's commercial strategies. <u>EC - Knowledge:</u> EC 1.1 Digital marketing strategies EC 1.2. Digital marketing tools EC 1.3. SWOT analysis in digital strategies <u>EC - Skills</u> EC 1.4. Analyze the relevant (digital) marketplace, finding the competitive key factors EC 1.5. Analyze the strategy and position of the firm towards the (digital) marketplace EC 1.6. Analyze the "digital awareness" of the firm and its digital skills EC 1.7. Develop a SWOT analysis in relation to digital strategies EC 1.8. Formulate an achievable digital strategy EC 1.9. Elaborate and carry out a digital marketing plan</p> <p>C2: Define and implement digital advertising campaigns according to commercial objectives, managing the current digital advertising techniques and tools. <u>EC - Knowledge:</u> EC 2.1. Impacts of the digital marketing on the firm processes: planning, production, and logistics management, selling EC 2.2. Digital marketing tools EC 2.3. Online marketing plan development: design, creation, and analysis of profitability in a digital marketing plan <u>EC - Skills</u> EC 2.4. Design and develop effective commercial landing pages EC 2.5. Implement digital adverts, mobile and video marketing campaigns</p>	<p>1. Digital marketing plan According to EC 1.1 – EC 1.7, EC 2.1, EC 2.2</p> <ul style="list-style-type: none"> • Online Marketing Plan development • Design, creation and analysis of profitability in a Digital Marketing Plan • Fundamental legal aspects • Agile methodologies • Design Thinking • Successful cases of a DMP • ROI workshop <p>2. Inbound Marketing & Marketing Automation According to EC 2.1 – 2.6</p> <ul style="list-style-type: none"> • How to attract your customer in a non-intrusive way • Landing pages and usability • E-mail marketing • Chat bots • Programming languages for marketing • SEO and SEM • Growth hacking <p>3. Digital marketing According to EC 2.1 – EC 2.6</p> <ul style="list-style-type: none"> • Real Time Bidding (RTB) • Affiliate Marketing • Google Adwords • Strategic use of social networks. • Ads in social networks. • Video Marketing. • Mobile and ubiquity. <ul style="list-style-type: none"> o Proximity marketing and location-based marketing. o Messaging o Advergaming <p>4. Digital analytics According to EC 3.1 – EC 3.5</p> <ul style="list-style-type: none"> • Web Analytics (WA) applied to Conversion Rate Optimization (CRO), on-page analysis, user knowledge. 	<p>1. The trainer, through an expository methodology will provide the students with information about strategies and digital marketing plans: their characteristics, types, parts and the different digital channels and how they work. This will be supported by written materials, case studies and videos. According to EC 1.1, EC 1.2, EC 1.3</p> <p>2. The students, in groups, and based on case studies will determine a Digital Marketing Plan to sell a new product or a new service in the Agrifood Sector by analyzing data and market information, different digital channels, SWOT analysis, characterizing the product or service, considering budget and commercial objectives. According to EC 1.4, 1.5, 1.6, 1.7</p> <p>3. The trainer, through a expository methodology, will explain different digital advertising tools and give examples to explain to students the use and principal characteristics of the different digital advertising tools: Landing pages, Email marketing, Inbound, SEO/SEM, Google Adwords, Social Media, Mobile Marketing. According to EC 2.1 – EC 2.6</p> <p>4. The trainer, through an expository methodology will provide the students with information about Conversion Rate Optimization (CRO) in Web Analytics (WA). According to EC 3.2</p> <p>5. The trainer, through a demonstrative method, will explain methods to calculate conversion rates, CRO, and Web measurement instruments and data analysis. According to EC 3.2, EC 3.5</p> <p>6. The students, in groups, and based on case studies will create digital campaigns using different marketing tools and channels and analyze the results obtained in each campaign by using data analysis tools. According to EC 2.7 – EC 2.13, EC 3.4 EC 3.5</p>	

<p>EC 2.6. Promote web campaigns, and landing pages</p> <p>C3: Understand and analyze the results of digital campaigns and actions using main data analysis tools and calculate its conversion ratios and profitability, determining strategies for their optimization.</p> <p><u>EC - Knowledge:</u></p> <p>EC 3.1. Digital promotional strategies: digital adverts in social media, mobile marketing campaigns, video marketing campaigns</p> <p>EC 3.2. Data analysis tools and strategies applied to digital advertising campaigns</p> <p><u>EC - Skills</u></p> <p>EC 3.3. Analyze the results of online marketing campaigns</p> <p>EC 3.4. Support the decision making of the firm</p> <p>EC 3.5. Develop a roadmap and support the firm in its application, using project management techniques</p>	<ul style="list-style-type: none"> • Web measurement focused on optimizing conversion rate and user knowledge. • Dashboards and reporting. • Data Analysis. 	
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COMPETENCE UNIT	D.9 E-commerce and customer experience	Duration	3 ECTS 100 hours
LEARNING OUTCOMES	METHODOLOGICAL STRATEGIES		
<p>C1: Define, customize, and manage e-commerce systems and their integration with content management systems <u>EC - Knowledge:</u> EC 1.1. E-commerce models and their characteristics EC 1.2. Existing digital marketplace platforms and their technological, operational, and costs characteristics EC 1.3. Barriers to e-commerce EC 1.4. Legal frameworks, requirements, and contracts in e-commerce (local and global markets) <u>EC - Skills</u> EC 1.5. Following the digital marketing strategy, examine the existing e-commerce platforms EC 1.6. Develop make or buy alternatives: develop a firm specific e-commerce application vs use a general-purpose platform already available EC 1.7. Evaluate costs and appraise foreseen impacts of the different alternatives</p> <p>C2: Manage logistics, processes, orders, and payment methods in e-Commerce systems <u>EC - Knowledge:</u> EC 2.1. Payment methods in e-commerce, their risks and costs. Risk assurance EC 2.2. Operational impacts of e-commerce processes: production planning, selling, distributing EC 2.3. Customer experience aspects and their impacts on the business conception and management EC 2.4. Principles of customer care and customer retention <u>EC - Skills</u> EC 2.4. Support the firm in technical and commercial relations to an e-commerce platform, or in the development of a proprietary solution EC 2.5. Define a customer care and retention approach, integrating business and digital</p>	<p>1. E-Commerce platforms According to EC 1.1 – EC 1.7.</p> <ul style="list-style-type: none"> • E-Commerce definition • Types of e-Commerce • Main e-Commerce models and characteristics • E-Commerce platforms • Open source • Legal requirements • E-Commerce processes: <ul style="list-style-type: none"> ○ Production planning ○ Selling ○ Distributing • Key elements of an online store • First steps to develop an e-commerce <p>2. Services management in e-commerce According to EC 2.1 – EC 2.6</p> <ul style="list-style-type: none"> • E-commerce logistics • Order management in e-commerce • Types of payment methods • E-commerce trends 	<ol style="list-style-type: none"> 1. The trainer, through an expository methodology will provide the students with information about existing e-commerce platforms: their characteristics, types, legal requirements, e-commerce processes, and a description of how they have to start an e-commerce and its key elements. This will be supported by written materials and videos. According to EC 1.1 – EC 1.4 2. The trainer will provide the students with: product catalogues, plans and any other necessary technical documentation specifying the characteristics of e-commerce platforms and their legal and security requirements. According to EC 1.2 – EC 1.7 3. The students, in groups of three, and based on a case study will analyze the state-of-the-art of the digital marketplace, identifying, and evaluating the opportunities, the available technological platforms, their requirements and costs. They will select the best e-commerce platforms to respond to their case of study. Then, they will define a road map to implement the e-commerce. In order to carry out this activity, it will be necessary to plan and organize the analysis to be carried out, as well as following the established instructions. The conclusions of the group will be gathered in a common consensual document. The trainer will provide plans, technical documentation and applicable regulations. After this analysis, there will be a sharing of the groups, feedback from the trainer and clarification of doubts. According to EC 1.5 – EC 1.7 4. The trainer through an expository methodology will explain the payment methods commonly used in e-commerce and the newest trends in this field. According to EC 2.1, EC 2.3. 5. The trainer, through an interrogative methodology, will individually formulate direct questions based on a battery of previously prepared questions concerning security criteria for payments and logistics in e-commerce. According to EC 2.2 	

<p>communication processes, reinforcing the customer experience EC 2.6. Develop a roadmap and support the firm in its application, using project management techniques</p>		<p>6. The trainer through a demonstrative method will show different existing e-commerce solutions, successful cases, real problems in logistics and management and their solutions. According to EC 2.4 – EC 2.6</p>
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5.5 Learning Assessment of AREA D

TRAINING MODULE		
DOMAIN APPLICATION	COMPETENCE UNIT	ACTIVITIES AND EVALUATION TOOLS
DOMAIN APPLICATION	D1 - Sustainable key concepts	<p>C1. Theoretical exam: Define the concept of sustainability.</p> <p>C2. Collect existing examples on digital strategies that lead to sustainability</p>
	D2 - Strategy, Data and Decision Support Systems	C1. Draw a concept map on agribusiness value chain, including examples of innovation actions considering sustainability and circular economy
	D3 - Data sensors: platforms (drones and satellites) and agronomic sensors	<p>C1. Make a SWOT analysis of the different sensor platform, taking into account their characteristics, regulation & costs</p> <p>C2. Build a case study of an existing farmland on agrobusiness and select the most appropriate tools for precision agriculture (analysis any index of real field)</p>
	D4 - Using data: GIS and data modelling	C1.-C3. Students will apply their knowledge & insight in GIS and data modelling in a new real situation. The results must be presented to the group and will be (peer) evaluated.
	D5 - Agronomic resource management	C1. Problem-based learning (in groups) will be presented and (peer) evaluated during presentations
	D6 - Integrated logistics	C1.-C2. Presentation of recommendations based on the problem-solving exercise / case study
	D7 - Traceability	C1.-C2. Practical assessment – to identify the origin and traceability of one or more products and describe / explain how they managed to do it. Comment on why traceability is important to the market environment of the products assessed.
	D8 - Digital Marketing	C1.-C3. Creation of a digital marketing plan and a digital campaign based on an analysis of case studies
	D9 - E-commerce and customer experience	C1.-C2. Write a technical report for the Head of a company: What are the challenges faced by a company / agri-business when developing an e-commerce solution, including user experience and usability?
		FINAL TEST OF THE TRAINING MODULE (theoretical and practical)
		Final Thesis based on the Work-based learning period.



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