

Advancing industrial digital and green innovations in the advanced textile industry through innovation in learning and training

EBOOK

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EXECUTIVE SUMMARY

This e-book is a practical guide for students to successfully understand and complete the MOOC Smart, Digital, Green Skills Academy, as well as to be able to successfully apply the acquired knowledge in practice.

The book explains the following,

- the context and goals of the Smart, Digital, Green Skills Academy
- course structure (3 thematic areas, 3 levels, 5 detailed topics)
- methodology for determining individual topics (analysis of business needs, links to the offer of formal education), their interconnectedness
- multi-level approach and utilization across the entire cross-section of competencies needed for the advanced textile industry
- content structure of individual modules
- •didactic procedures of inculcating knowledge and checking acquired knowledge.
- technical implementation of learning modules e-learning platform environment
- methods of practical verification by students quizzes, case studies, study materials
- the microcredit system of their usability and applicability

RECOMMENDATIONS FOR STUDENTS AND TRAINEES:

We recommend reading this e-book carefully before starting the course and launch the course at the level that best suited from the point of view of professional focus. Of course, this approach does not exclude the subsequent stage and other levels and topics at your own discretion.

The authors of the texts will also welcome your feedback, as well as communication of the difficulties you encountered during your studies. They will also welcome communication of other topics that you consider necessary for the stage. This information will be a source of further useful stimuli for us for the further development of the field of advanced textile materials and smart (technologically advanced), green and digital transformation





PROJECT DESCRIPTION

GREEN - SMART - DIGITAL

Technical textiles are a thriving sub-sector in the textile and apparel ecosystem across Europe, based on high added value and differentiation as a unique selling proposition. Innovation in this area is key to strengthening the resilience of the EU textile sector and ensuring its competitiveness, especially in volatile, uncertain, complex, and ambiguous environments (VUCA) such as those created by the COVID-19 pandemic.

Against this background, the three-year EU project Addtex, "Advancing industrial digital and green innovations in the advanced textile industry through innovation in learning and training", created the present virtual training programme for the textile industry. The main objective of the project, co-funded under the Erasmus Plus programme of the European Union (Project No. 101056303), is to support the resilience and sustainable GREEN, DIGITAL and SMART transition, and progress in the textile sector through innovative learning and training. Digitalization and green innovation, as well as "smart" processes, are needed to tackle climate change and further improve the sustainability of the sector. The declared goal is to make the European textile industry fit for a green, digital, innovative future.

To this end, 12 partners from 10 EU countries have developed tailor-made school materials based on analyses and field research to facilitate the flow of knowledge and the joint creation of knowledge between universities and vocational education and training, research, public institutions, and companies in the sector of innovative textile materials / technical textiles, as well as to promote new, innovative, and multidisciplinary approaches to teaching and learning. The partnership between companies, clusters, higher education, and vocational training institutions from the technical textiles sector sees great potential for smart textile innovations including digital and green skills. Therefore, the teaching materials now available focus on these three special topics.

The newly created platform www.addtex.eu makes it possible to individually acquire the necessary skills based on its target group-oriented teaching materials, which are of crucial importance for the future of the socio-economic textile environment in Europe. At the same time, it aims to strengthen and promote a sense of initiative and entrepreneurial attitudes, mindsets and skills among learners, education staff and skilled workers in line with the Green Deal and Entrepreneurship Competence Framework. The strength and expertise of established and developing industrial clusters will continue to build capabilities, support the growth of the textile sector, and provide opportunities for impact-oriented, sector-specific research.

The partners of the consortium are:

- AEI TÈTILS ASSOCIACIO AGRUPACIO D'EMPRESES INNOVADORES TEXTILS (Koordinator)
- CLUTEX KLASTR TECHNICKE TEXTILIE
- CITEVE CENTRO TECNOLOGICO DAS INDUSTRIAS TEXTIL E DO VESTUARIO DE PORTUGAL
- IVGT INDUSTRIEVERBAND VEREDLUNG GARNE- GEWEBE TECHNISCHE TEXTILIEN
- TITERA TEHNICNO INOVATIVNE TEHNOLOGIJE, DOO

- UPC UNIVERSITAT POLITECNICA DE CATALUNYA
- UB HOGSKOLAN I BORÅS (UB),
- TUS TECHNOLOGICAL UNIVERSITY OF THE SHANNON: MIDLANDS MIDWEST
- PIN PIN SOC.CONS. A R.L. SERVIZI DIDATTICI E SCIENTIFICI PER L UNIVERSITA DI
- FIRENZE
- CRE.THI.DEV DIMIOURGIKI SKEPSI ANAPTYXIS
- CIAPE CENTRO ITALIANO PER L'APPRENDIMENTO PERMANENTE
- INCDTP -
- INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU TEXTILESI PIELARIE

For more information and updates, visit the official project website:

AddTex is also on social media at the following links:

- Facebook: https://www.facebook.com/AddTexEU/
- Twitter: @AddTex EU
- Instagram: addtex_eu
- YouTube: @AddTexEU

ROADMAP



ADDTEX CONSORTIUM





SMART, DIGITAL AND GREEN SKILLS ACADEMY

The **Smart, Digital and Green Skills Academy** created in the framework of the AddTex project, includes **9 short innovative training courses** contributing to upskilling competencies in the **green, digital,** and **smart transition** in the textile industry.

The courses, delivered virtually through a **MOOC** and completed by **case studies**, have been created to respond to the need of textile workers to update and improve their knowledge, skills, and competencies to fill the gap between their formal education and training and the needs of a fast-changing labour market as well as the current challenges in the textile sector.

The core idea behind the **AddTex Academy** was to design and develop short but significant and flexible learning experiences for textile professionals at different levels, which can be complementary to the experience acquired through formal education.

Apart from that, the courses have been developed in a way to make it possible to integrate them easily into blended learning paths, which apply both work-based learning and/or flipped classroom methodologies.

The learning outcomes and contents of each course are differentiated according to three main target groups corresponding to **different job profiles within the textile in-dustry** as tabulated in Figure 1.



Figure 1: AddTex Academy targeted job profiles

THE CONTENTS

Contents are divided into 3 modules as follows:



Figure 2: AddTex Academy modules

In each module, 3 different learning paths are foreseen; one for engineers and professionals, one for technicians and graduates and one for managers and mentors.

Each learning path contains 5 units of lectures; therefore the entire training covering all 3 modules for each target group includes 15 lectures. In total, 45 lectures are available corresponding to the aforementioned 9 short innovative training courses.

One unit of lecture is based on videos accessible through smartphone, computer, or tablet; each video lecture lasts 15 minutes; however, learners should consider an additional 15 minutes for going through the additional course materials which correspond to case studies and quizzes and others 30 minutes of self-study.

GREEN TRANSITION

Prerequisites

This course can be undertaken by industry professionals from different levels of seniority and education, as well as students and prospective industry workers. It should demand basic knowledge of the industry, supply chain and manufacturing processes.

Modules

This course covers, at different levels of complexity, key concepts of green transition in the textile industry and key elements enabling this process and measurement of environmental impact.



Figure 3: Green transition units of learning

LEARNING PATH FOR TECHNICIANS AND GRADUATES

By completing this module **technicians and graduates** will be able to demonstrate knowledge of practical concepts of sustainable textile materials and technologies and tools to evaluate textiles' environmental impact.

UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
ULO1- Understanding green transition	CONCEPTS OF SUSTAINABILITY, CIRCULAR ECONOMY AND DESIGN FOR SUSTAINABILITY	 UNDERSTAND THE RELEVANCE OF GREEN TRANSITION UNDERSTAND THE RELEVANCE OF DESIGN FOR SUSTAINABILITY 	 INTRODUCTION TO GREEN TRANSITION CONCEPT BASIC TERMINOLOGY KEY POINTS TO UNDERSTAND THE EU STRATEGY FOR SUSTAINABLE AND CIRCULAR TEXTILES
ULO2- Raw materials for green transition	TYPES AND MAIN CHARACTERISTICS OF SUSTAINABLE TEXTILE MATERIALS	KNOW THE BASIC CHARACTERISTICS OF NEW SUSTAINABLE TEXTILE MATERIALS FOR THEIR PROPER MANIPULATION AND USE IN THE TEXTILE PROCESSES	OVERVIEW ON NEW SUSTAINABLE TEXTILE MATERIALS
ULO3- Fibre-to-fibre textile recycling	BASICS OF THE EXISTING TECHNOLOGIES FOR FIBRE-TO-FIBRE RECYCLING, EQUIPMENT FOR FIBRE- TO-FIBRE RECYCLING	IDENTIFY THE MACHINERY AND THE MAIN PARAMETERS TO CONTROL FOR TEXTILE RECYCLING	 BASIC CONCEPTS ABOUT FIBRE-TO-FIBRE RECYCLING MACHINERY FOR THERMAL RECYCLING MACHINERY FOR MECHANICAL RECYCLING EQUIPMENT FOR CHEMICAL RECYCLING
ULO4- Technologies for a resource- efficient manufacturing	EMERGENT SUSTAINABLE TEXTILE TECHNOLOGIES	IDENTIFY THE MACHINERY USED FOR PLASMA, OZONE AND SUPERCRITICAL CARBON DIOXIDE TECHNOLOGIES	 INTRODUCTION TO NEW TECHNOLOGIES FOR A RESOURCE-EFFICIENT MANUFACTURING EQUIPMENT FOR PLASMA TECHNOLOGIES APPLIED TO TEXTILE PROCESSES EQUIPMENT FOR OZONE TECHNOLOGIES APPLIED TO TEXTILE PROCESSES EQUIPMENT FOR SUPERCRITICAL CARBON DIOXIDE APPLIED TO TEXTILE PROCESSES
ULO5- Evaluating environmental impact of the textile industry	MOST RELEVANT ENVIRONMENTAL IMPACTS ALONG THE VALUE CHAIN OF THE TEXTILE INDUSTRY	 CONDUCT COLLECTING AND REPORTING INPUT DATA FOR ENVIRONMENTAL ASSESSMENT USE DATA VISUALISATION TOOLS 	INTRODUCTION TO ENVIRONMENTAL IMPACT OF RAW MATERIALS AND TEXTILE PROCESSES INTRODUCTION TO TOOLS FOR ENVIRONMENTAL ANALYSIS LIFE CYCLE ASSESSMENT (LCA) DATA GATHERING FOR ENVIRONMENTAL ANALYSIS

Figure 4: Green transition for technician graduates microstructure and learning objectives

LEARNING PATH FOR ENGINEERS AND PROFESSIONALS

By completing this module **engineers and professionals** will be able to demonstrate deep knowledge of sustainable textile materials and technologies and tools to evaluate textiles' environmental impact in order to develop new textile products or processes that fulfil EU green policies.

UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
ULO1- Understanding green transition	CONCEPTS RELATED WITH SUSTAINABILITY AND CIRCULAR ECONOMY, MAIN ECO-DESIGN, STRATEGIES FOR LOW IMPACT PRODUCTION, MAIN ENVIRONMENTAL REGULATIONS AND POLICIES INVOLVED IN THE TEXTILE INDUSTRY	 APPLY ECO-DESIGN STRATEGIES FOR THE DEVELOPMENT OR IMPROVEMENT OF TEXTILE PRODUCTS USE TEXTILE PROCESSES THAT ALIGN WITH THE EU GREEN POLICIES 	GREEN TRANSITION CONCEPT DESIGN FOR SUSTAINABILITY INTRODUCTION TO THE EU STRATEGY FOR SUSTAINABLE AND CIRCULAR TEXTILES BASICS OF LEGISLATION & REGULATIONS
ULO2- Raw materials for green transition	TYPES AND MAIN CHARACTERISTICS OF SUSTAINABLE FIBRES, MAIN CHARACTERISTICS OF SUSTAINABLE DYES AND PIGMENTS, FINISHING AND AUXILIARY PRODUCTS	USE SUSTAINABLE MATERIALS	 FIBRES DYES & PIGMENTS FINISHING PRODUCTS AUXILIARY PRODUCTS
ULO3- Fibre-to- fibre textile recycling	TECHNOLOGIES FOR FIBRE-TO-FIBRE RECYCLING	IDENTIFY THE BEST PRACTICES FOR FIBRE-TO-FIBRE RECYCLING	 INTRODUCTION TO FIBRE-TO-FIBRE RECYCLING PRODUCTION OF NEW FIBRES BY THERMAL RECYCLING OBTENTION OF FIBRES BY MECHANICAL RECYCLING PRODUCTION OF NEW FIBRES BY CHEMICAL RECYCLING
ULO4- Technologies for a resource- efficient manufacturing	ECO-FRIENDLY SOLVENTS AND CHEMICALS ON WET PROCESSES, PLASMA, OZONE AND SUPERCRITICAL CARBON DIOXIDE TECHNOLOGIES ON TEXTILE PROCESSES	SEEK INNOVATION IN CURRENT TEXTILE PROCESSES	 WET PROCESSES AVOIDING HARMFUL SOLVENTS OR CHEMICALS PLASMA TECHNOLOGIES APPLIED TO TEXTILE PROCESSES OZONE TECHNOLOGIES APPLIED TO TEXTILE PROCESSES SUPERCRITICAL CARBON DIOXIDE APPLIED TO TEXTILE PROCESSES
ULO5- Evaluating environmental impact of the textile industry	ENVIRONMENTAL IMPACTS RELATED TO TEXTILE MATERIALS AND PROCESSES LCA FOR TEXTILES	IDENTIFY THE BEST PRACTICES FOR MEASURING ENVIRONMENTAL IMPACT	ENVIRONMENTAL IMPACT OF RAW MATERIALS ENVIRONMENTAL IMPACT OF TEXTILE PROCESSES INTRODUCTION TO LIFE CYCLE ASSESSMENT

Figure 5: Green transition for engineers and professionals microstructure and learning objectives

LEARNING PATH FOR MANAGERS OR MENTORS

By completing this module **managers and mentor**s will be able to lead the implementation/adaptation of the textile materials and processes used in the textile industry to reduce the environmental impact and contribute to the green transition.

UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
ULO1- Understanding green transition	CONCEPTS RELATED TO SUSTAINABILITY AND CIRCULAR ECONOMY, ECO-DESIGN STRATEGIES FOR LOW IMPACT PRODUCTION, EU STRATEGIES, REGULATIONS AND LEGISLATION APPLICABLE TO THE TEXTILE SECTOR	SEEK INNOVATION IN THE TEXTILE ACTIVITY FOR ITS ALIGNMENT WITH THE EU POLICIES	GREEN TRANSITION CONCEPT TERMINOLOGY DESIGN FOR SUSTAINABILITY EU STRATEGY FOR SUSTAINABLE AND CIRCULAR TEXTILES LEGISLATION & REGULATIONS
ULO2- Raw materials for green transition	ADVANCES ON SUSTAINABLE TEXTILE MATERIALS	USE SUSTAINABLE MATERIALS	TRENDS ON SUSTAINABLE FIBRES TRENDS ON SUSTAINABLE DYES & PIGMENTS TRENDS ON SUSTAINABLE FINISHING PRODUCTS TRENDS ON SUSTAINABLE AUXILIARY PRODUCTS
ULO3- Fibre-to- fibre textile recycling	EXISTING TECHNOLOGIES FOR FIBRE-TO- FIBRE RECYCLING	IDENTIFY NEW RECYCLING OPPORTUNITIES FOR TEXTILE PRODUCTS	 FIBRE-TO-FIBRE RECYCLING FOR PRODUCT DEVELOPMENT THERMAL RECYCLING FOR PRODUCT DEVELOPMENT MECHANICAL RECYCLING FOR PRODUCT DEVELOPMENT CHEMICAL RECYCLING FOR PRODUCT DEVELOPMENT
ULO4- Technologies for a resource- efficient manufacturing	ADVANCES IN SUSTAINABLE TEXTILE PROCESSES	PROMOTE SUSTAINABLE TEXTILE PROCESSES	 ADVANCES ON WET PROCESSES AVOIDING HARMFUL SOLVENTS OR CHEMICALS ADVANCES ON PLASMA TECHNOLOGIES APPLIED T TEXTILE PROCESSES ADVANCES ON OZONE TECHNOLOGIES APPLIED TO TEXTILE PROCESSES ADVANCES ON SUPERCRITICAL CARBON DIOXIDE APPLIED TO TEXTILE PROCESSES
JLO5- Evaluating environmental impact of the textile industry	ENVIRONMENTAL IMPACTS RELATED TO MATERIALS AND PROCESSES USED IN THE TEXTILE INDUSTRY, LCA AS A TOOL FOR OPTIMISATION OF TEXTILE MANUFACTURING	IDENTIFY THE PROCESSES WITH HIGHER IMPACTS TO PROPOSE ALTERNATIVE SOLUTIONS	ENVIRONMENTAL IMPACT OF RAW MATERIALS ENVIRONMENTAL IMPACT OF TEXTILE PROCESSES LIFE CYCLE ASSESSMENT (LCA) REPORTS TRACEABILITY ACROSS ALL CRITICAL PHASES AND AREAS OF OPERATIONS

Figure 6: Green transition for managers and mentors microstructure and learning objectives

DIGITAL TRANSITION

Prerequisites

This course can be undertaken by industry professionals from different levels of seniority and education, as well as students and prospective industry workers. It should demand some basic knowledge of industry and business terminology, logistics, supply chains and related technologies. Familiarity with e-learning environments and computer-assisted courses as well as basic IT and digital skills are also desirable.

Modules

This course covers, at different levels of complexity, key concepts of **digitalisation** in the textile industry and key technologies enabling this process.



Figure 7: Digital transition units of learning

LEARNING PATH FOR TECHNICIANS AND GRADUATES

By completing this module **technicians and graduates** will acquire operations-focused and practical concepts and skills with immediate applicability.

UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
ULO1- Digital Maturity and New Business Models	DRIVERS OF DIGITAL TRANSFORMATION AND THE DIGITAL MATURITY MODEL, BUSINESS MODEL INNOVATION FOR ORGANIZATIONAL SUCCESS, DATA ANALYTICS, DIGITAL MARKETING AND CUSTOMER EXPERIENCE IN DRIVING GROWTH	 ANALYSE INFORMATION SYSTEMS CREATE BUSINESS MODEL ANALYSE BUSINESS PROCESS 	DIGITALIZATION NEW CONSUMPTION TRENDS BUSINESS MODELS INNOVATION BUSINESS RISKS AND CHALLENGES
ULO2- Data Acquisition, Visualisation and Analytics	BASIC CONCEPTS OF DATA ACQUISITION, VISUALISATION, AND ANALYTICS, TYPES OF DATA AND SOURCES, HOW TO OBTAIN AND PREPARE DATA FOR ANALYSIS, ETHICAL CONSIDERATIONS AND BIASES ASSOCIATED WITH DATA ACQUISITION, VISUALIZATION, AND ANALYTICS	ANALYSE BIG DATA USE DATA PROCESSING TECHNIQUES	 DATA ACQUISITION AND PREPARATION DATA VISUALISATION DATA ANALYTICS AND MACHINE LEARNING ETHICS AND BIAS IN DATA ANALYTICS
ULO3- Smart Maintenance, Smart Industrial Control Systems	BASIC PRINCIPLES AND APPLICATION TO SPECIFIC JOB FUNCTIONS, DIFFERENT TYPES OF SENSORS AND SYSTEMS USED AND INSTALLATION AND MAINTAINANCE THE ROLE OF DATA ANALYTICS, HOW TO COLLECT AND ANALYSE SENSOR DATA	 EXPLAIN FUNCTIONAL TEXTILES AND THEIR PROPERTIES IDENTIFY RECENT INNOVATIONS 	OVERVIEW ON FUNCTIONAL TEXTILES PROPERTIES OF FUNCTIONAL TEXTILES INNOVATION IN FUNCTIONAL TEXTILES
ULO4- Collaborative Robotic Systems and Digitalisation of Production	KINEMATICS, DYNAMICS, AND CONTROL, SAFETY CONSIDERATIONS AND STANDARDS ASSOCIATED WITH COLLABORATIVE ROBOTIC SYSTEMS, DIFFERENT TYPES OF SENSORS USED IN COLLABORATIVE ROBOTIC SYSTEMS, BASIC PROGRAMMING CONCEPTS FOR COLLABORATIVE ROBOTIC SYSTEMS	ASSEMBLE ROBOTS KEEP UP WITH DIGITAL TRANSFORMATION OF INDUSTRIAL PROCESSES MAINTAIN ROBOTIC EQUIPMENT	INDUSTRY 4.0: PRINCIPLES AND IMPLEMENTATION DIGITALISATION OF PRODUCTION: CONCEPTS AND TECHNOLOGIES COLLABORATIVE ROBDIC SYSTEMS: PRINCIPLES AND APPLICATIONS INTEGRATION OF COLLABORATIVE ROBOTIC SYSTEMS AND DIGITALISATION
ULO5- Marketing and Communication	BASIC OF DIGITAL MARKETING AND IMPACT ON JOB PROFILES, CHANNELS AND TOOLS, SEO, SOCIAL MEDIA MARKETING, EMAIL MARKETING, AND DATA ANALYTICS, AUDIENCE AND AUDIENCE SEGMENTATION STRATEGIES, CUSTOMER ENGAGEMENT AND EXPERIENCE	USE DIGITAL TECHNOLOGIES EXECUTE MARKETING PLAN ANALYSING AND EVALUATING INFORMATION AND DATA	DIGITAL MARKETING FUNDAMENTALS AUDIENCE SEGMENTATION AND TARGETING DATA ANALYTICS AND METRICS CUSTOMER ORDERS TRACKING SYSTEMS

Figure 8: Digital transition for technician graduates microstructure and learning objectives

LEARNING PATH FOR ENGINEERS AND PROFESSIONALS

By completing this module **engineers and professionals** will acquire in-depth technical concepts and skills able to impact current and future operations at the company level.

	UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
	ULO1- Digital Maturity and New Business Models	DIGITAL TRANSFORMATION FOR ORGANIZATIONAL SUCCESS, THE ROLE OF MANAGERS IN LEADING DIGITAL TRANSFORMATION, BUSINESS MODEL INNOVATION FOR ORGANIZATIONAL SUCCESS, DATA ANALYTICS FOR STRATEGIC DECISION MAKING, DIGITAL MARKETING AND CUSTOMER EXPERIENCE FOR BUSINESS GROWTH	ANALYSE INFORMATION SYSTEMS CREATE AND ANALYSE BUSINESS MODELS SHAPE CORPORATE CULTURE	 DIGITAL MATURITY AND TRANSFORMATION ROADMAP NEW CONSUMPTION TRENDS BUSINESS MODELS INNOVATION BUSINESS RISKS AND CHALLENGES
	ULO2- Data IMPORTANCE OF DATA ACQUISITION, VISUALISATION AND Acquisition, ANALYTICS FOR ORGANIZATIONAL SUCCESS, DATA-DRIVEN CULTURE WITHIN THE ORGANIZATION, Visualisation and Analytics IMPORTANCE OF DATA ACQUISITION, VISUALISATION AND Analytics IMPORTANCE OF DATA ACQUISITION, VISUALISATION AND Analytics IMPORTANCE OF DATA ACQUISITION, VISUALISATION, AND ANALYTICS Analytics		 DATA ACQUISITION, PREPARATION AND VISUALISATION DATA ANALYTICS AND MACHINE LEARNING ETHICS AND BIAS IN DATA ANALYTICS 	
	ULO3- Smart Maintenance, Smart Industrial Control Systems	SMART MAINTENANCE AND INDUSTRIAL CONTROL SYSTEMS AND IMPACT ON ORGANIZATIONAL EFFICIENCY AND PRODUCTIVITY, SENSORS AND SYSTEMS AND THEIR SELECTION FOR SPECIFIC APPLICATIONS, DATA ANALYTICS AND MACHINE LEARNING AND THEIR USE FOR DATA-DRIVEN DECISIONS, RISKS ASSOCIATED WITH SMART MAINTENANCE AND INDUSTRIAL CONTROL SYSTEMS AND THEIR MANAGEMENT	INSTALL SMART DEVICES DEFINE A TECHNOLOGY STRATEGY LEAD TECHNOLOGY DEVELOPMENT IN THE ORGANISATION	SENSORS AND DATA COLLECTION CONDITION BASED AND PREDICTIVE MAINTENANCE INDUSTRIAL CONTROL SYSTEMS IMPLEMENTATION AND MANAGEMENT OF SMART MAINTENANCE AND INDUSTRIAL CONTROL SYSTEMS
ULO4- Collaborative Robotic Systems and Digitalisation of Production BENEFITS AND RESOURCE WITH COLLABORATIVE ROBOTIC AND DIGITALIZATION OF PRODUCTION, COLLABORATIVE ROBOTIC SYSTEMS AND THEIR APPLICATIONS IN INDUSTRIAL PRODUCTION		ASSEMBLE ROBOTS KEEP UP WITH DIGITAL TRANSFORMATION OF INDUSTRIAL PROCESSES EVALUATE SYSTEMS, PROGRAMMES EQUIPMENT PRODUCTS	 INDUSTRY 4.0: PRINCIPLES AND IMPLEMENTATION DIGITALISATION OF PRODUCTION: CONCEPTS AND TECHNOLOGIES COLLABORATIVE ROBOTIC SYSTEMS: PRINCIPLES, APPLICATIONS AND THEIR INTEGRATION DIGITALISATION 	
	ULO5- Marketing and Communication	DIGITAL MARKETING AND IMPACT ON PERFORMANCE CHANNELS AND TOOLS, SEO, SOCIAL MEDIA MARKETING, EMAIL MARKETING, DATA ANALYTICS, AUDIENCE AND AUDIENCE SEGMENTATION STRATEGIES, CUSTOMER ENGAGEMENT AND EXPENIENCE, LEGAL AND ETHICAL ISSUES IN DIGITAL MARKETING	USE DIGITAL TECHNOLOGIES EXECUTE MARKETING PLAN ANALYSE AND EVALUATE INFORMATION AND DATA DEVELOP COMMUNICATION STRATEGIES	 DIGITAL MARKETING FUNDAMENTALS AUDIENCE SEGMENTATION AND TARGETING DATA ANALYTICS AND METRICS CUSTOMER ORDERS TRACKING SYSTEMS

Figure 9: Digital transition for engineers and professionals microstructure and learning objectives

LEARNING PATH FOR MANAGERS OR MENTORS

By completing this module **managers and mentors** will acquire core concepts and skills with a corporate and company-wide scope, with a potential impact on companies' cultures and policies.

UNITS OF MAIN TOPICS LECTURES		OBJECTIVES	DETAILED TOPICS	
	ULO1- Digital Maturity and New Business Models	STRATEGIC IMPLICATIONS OF DIGITAL TRANSFORMATION AND IMPACT ON BUSINESS MODEL, THE IMPORTANCE OF BUSINESS MODEL INNOVATION FOR ORGANIZATIONAL SUCCESS, DATA ANALYTICS FOR DRIVING BUSINESS GROWTH AND INNOVATION, DIGITAL ENGAGEMENT FOR CUSTOMER EXPERIENCE	ANALYSE INFORMATION SYSTEMS CREATE BUSINESS PROCESS MODELS ANALYSE BUSINESS PROCESS	DIGITAL TRANSFORMATION NEW CONSUMPTION TRENDS BUSINESS MODELS INNOVATION DIGITAL CUSTOMER ENGAGEMENT
	ULO2- Data Acquisition, Visualisation and Analytics	DATA ACQUISITION, VISUALISATION, AND ANALYTICS IN BUSINESS DECISION MAKING, TYPES OF DATA AND DATA SOURCES, AND THEIR PREPARATION FOR ANALYSIS, MACHINE LEARNING MODELS AND TECHNIQUES USED IN DATA ANALYTICS AND THEIR APPLICATIONS	ANALYSE BIG DATA USE DATA PROCESSING TECHNIQUES	 DATA ACQUISITION, PREPARATION VISUALISATION DATA ANALYTICS AND MACHINE LEARNING ETHICS AND BIAS IN DATA ANALYTICS
	ULO3- Smart Maintenance, Smart Industrial Control Systems	PRINCIPLES AND THEIR APPLICATION TO DIFFERENT ENGINEERING FACILITIES, SENSORS AND SYSTEMS USED AND THEIR SELECTION FOR DIFFERENT APPLICATIONS, DATA ANALYTICS AND MACHINE LEARNING AND THEIR USE TO OPTIMIZE MAINTENANCE AND CONTROL PROCESSES	INSTALL SMART DEVICES CARRY OUT PRACTICAL TASKS WITH SMART DEVICES	SENSORS AND DATA COLLECTION CONDITION BASED AND PREDICTIVE MAINTENANCE INDUSTRIAL CONTROL SYSTEMS IMPLEMENTATION AND MANAGEMENT OF SMART MAINTENANCE AND SMART INDUSTRIAL CONTROL SYSTEM
ULO4- Collaborative Robotic Systems and Digitalisation of Production ROBOTIC Systems Programming And Control, SAFETY CONSIDERATIONS AND STANDARDS ASSOCIATED WITH COLLABORATIVE ROBOTIC SYSTEMS, TYPES OF SENSORS USED IN COLLABORATIVE ROBOTIC SYSTEMS, PROGRAMMING LANGUAGES AND SOFTWARE TOOLS USED FOR PROGRAMMING AND CONTROLLING COLLABORATIVE ROBOTIC SYSTEMS.		ASSEMBLE ROBOTS KEEP UP WITH DIGITAL TRANSFORMATION OF INDUSTRIAL PROCESSES MANTAIN ROBOTIC EQUIPEMENTS	 INDUSTRY 4.0: PRINCIPLES AND IMPLEMENTATION DIGITALISATION OF PRODUCTION: CONCEPTS AND TECHNOLOGIES COLLABORATIVE ROBOTIC SYSTEMS: PRINCIPLES, APPLICATIONS AND THEIR INTEGRATION DIGITALISATION 	
	ULO5- Marketing and Communication	DIGITAL MARKETING AND IMPACT ON PERFORMANCE CHANNELS AND TOOLS, SEO, SOCIAL MEDIA MARKETING, EMAIL MARKETING, DATA ANALYTICS, AUDIENCE AND AUDIENCE SEGMENTATION STRATEGIES, LEGAL AND ETHICAL CONSIDERATIONS IN DIGITAL MARKETING AND COMMUNICATION, CUSTOMER ORDER AND TRACKING SYSTEMS FOR CUSTOMER ENGAGEMENT AND EXPERIENCE	USE DIGITAL TECHNOLOGIES EXECUTE MARKETING PLAN ANALYSE AND EVALUATE INFORMATION AND DATA	DIGITAL MARKETING FUNDAMENTALS AUDIENCE SEGMENTATION AND TARGETING DATA ANALYTICS AND METRICS CUSTOMER ORDERS TRACKING SYSTEMS

Figure 10: Digital transition for managers and mentors microstructure and learning objectives

SMART TRANSITION

Prerequisites

To undertake the course, the learner should have some basic knowledge of textile fibres, processing techniques, and basic techniques and technologies of textiles. Familiarity with e-learning environments and computer-assisted courses as well as basic IT and digital skills are also desirable.

Modules

The short learning course will introduce terms and definitions of **smart transition** in the textile industry and their evolution in time and technologies.



Figure 11: Smart transition units of learning

LEARNING PATH FOR TECHNICIANS AND GRADUATES

By completing this module, **technicians and graduates** will be able to demonstrate fundamental processes and material development in the domain of smart textiles.

	UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
	ULO1- Smart textile: Introduction and challenges	SMART TEXTILE TRENDS, EMERGENT TECHNOLOGIES, USER EXPERIENCE CHALLENGES.	SEEK INNOVATION IN CURRENT TEXTILE PRACTICES	 SMART TEXTILES TRENDS AND EMERGING TECHNOLOGIES INNOVATIVE APPLICATION AREAS CHALLENGES FOR SMART TEXTILES RELATED TO USER EXPERIENCE
	ULO2- Innovations linked to smart/intelligent textiles	MEDICAL, TRANSPORT, ENERGY, PROTECTION AND COMMUNICATION APPLICATION OF SMART TEXTILES	SEEK INNOVATION IN CURRENT PRACTICES ASSOCIATED TO SMART TEXTILE APPLICATIONS	SMART TEXTILES FOR MEDICAL PURPOSES SMART TEXTILES FOR TRANSPORTATION AND ENERGY SMART TEXTILES FOR PROTECTION AND COMMUNICATION
	ULO3-Innovations linked to functional textiles	TEXTILE MATERIALS SCIENTIFIC AND TECHNOLOGICAL INNOVATION FOR TEXTILE PRODUCT DEVELOPMENT	DEVELOP FUNCTIONAL TEXTILES	 CHROMIC MATERIALS ANTIBACTERIAL TEXTILES AND SMART WOUND DRESSING SHAPE MEMORY POLYMERS
	ULO4- Resource efficient textile technologies for smart and functional textiles	SUSTAINABLE TEXTILE PROCESSING TECHNIQUES, TEXTILE PRINTING TECHNOLOGIES	USE SUSTAINABLE MATERIAL AND COMPONENTS	 INTRODUCTION OF SUSTAINABLE TECHNOLOGIES DIGITAL PRINTING TECHNIQUES 3D PRINTING FOR SMART TEXTILE DEVELOPMENT
	ULO5- Integration of technologies to develop composites and electronic textiles (e-textiles)	SMART TEXTILE PRODUCTION TECHNOLOGIES, INTERNET OF THINGS FOR TEXTILES	IDENTIFY THE BEST PRACTICES TO PRODUCE SMART TEXTILES	 OVERVIEW ON 2D AND 3D JOINING TECHNIQUES OF SMART TEXTILES (FIXED AND ATTACHABLE) EMBEDDING AND INTEGRATION OF ELECTRONIC COMPONENT (E-TEXTILES) FABRICATION METHODS AND FUNCTIONAL FINISHING

Figure 12: Smart transition for Technicians and graduates microstructure and learning objectives

LEARNING PATH FOR ENGINEERS AND PROFESSIONALS

By completing this module, **engineers and professionals** will demonstrate smart textile knowledge for advanced functional applications, challenges and opportunities.

LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS	
ULO1- Smart textile: Introduction and challenges	OPPORTUNITIES AND CHALLENGES IN THE TEXTILE INDUSTRY	 MARKET NEEDS AND DEVELOPMENT DEVELOP SMART TEXTILES 	SMART TEXTILES MARKETS AND INNOVATIVE PROCESSES EMERGING APPLICATION AREAS CHALLENGES FOR SMART TEXTILES RELATED TO CRITICAL FACTORS	
ULO2- Innovations linked to smart/intelligent textiles	RESEARCH AND INNOVATION IN SMART TEXTILES	SEEK INNOVATION IN SMART TEXTILES	 SMART TEXTILE DEVELOPMENT AND APPLICATIONS ADVANCES IN SMART TEXTILE APPLICATIONS 	
ULO3-Innovations linked to functional textiles	ADVANCES IN TEXTILE FUNZTIONALITIES	DEVELOP FUNCTIONAL TEXTILES AND TEXTILE PROCESS	DEVELOPMENT OF FUNCTIONAL MATERIALS AND TEXTILES SUCH AS CROMIC MATERIALS AND BACTERIAL RESISTANT TEXTILES NEEDS AND ADVANCES IN DEVELOPMENT OF FUNCTIONAL TEXTILES	
ULO4- Resource efficient textile technologies for smart and functional textiles	TEXTILE PRINTING TECHNOLOGIES DEVELOPMENT	USE ECO-EFFICIENT TECHNIQUES	 MANIFACTURING TECNOLOGY FOR SUSTAINABLE DEVELOPMENT TECHNOLOGY TRENDS TO DEVELOP SMART AND FUNCTIONAL TEXTILES 	
ULO5- Integration of technologies to develop composites and electronic textiles (e-textiles)	INTEGRATED TECHNIQUES FOR DESIGN, DEVELOPMENT AND MANIFACTURING FOR SMART TEXTILES, DIFFERENTIATE AMONG THE PRINCIPLES AS WELL AS PRONS AND CONS OF DIFFERENT INTEGRATION TECHNIQUES FOR INDUSTRIAL GROWTH	DEVELOP ELETRONIC AND INTELLIGENT TEXTILES	 ADVANCES IN TECHNIQUES OF ELECTRONIC TEXTILE DEVELOPMENT METHODS AND TECHNIQUES FOR INTEGRATION OF TECHNOLOGIES TO DEVELOP E-TEXTILES 	

Figure 13: Smart transition for engineers and professionals microstructure and learning objectives

LEARNING PATH FOR MANAGERS OR MENTORS

By completing this module, **managers and mentors** will be able to embrace smart textiles and innovative processes with the scope of implement/adapt at the level to attain compatibility with The 2030 Agenda for Sustainable Development.

UNITS OF LECTURES	MAIN TOPICS	OBJECTIVES	DETAILED TOPICS
ULO1- Smart textile: Introduction and challenges	BASICS OF SMART TEXTILES, PREPARATION METHODS, TECHNOLOGICAL CHALLENGES	BE ABLE TO EXPLAIN SMART TEXTILES AND IDENTIFY THE COMMON METHODS OF PREPARATION AND CHALLENGES	 SMART TEXTILES TERMS AND DEFINITIONS COMMON PREPARATION METHODS CHALLENGES FOR SMART TEXTILES RELATED TO TECHNOLOGY
ULO2- Innovations linked to smart/intelligent textiles	APPLICATION AREA OF SMART TEXTILES, RECENT INNOVATION	IDENTIFYING APPLICATION AREA AND RECOGNIZE RECENT INNOVATIONS IN SMART TEXTILES	 OVERVIEW ON DIFFERENT APPLICATION OF SMART TEXTILES INNOVATIONS IN SMART TEXTILES
ULO3-Innovations linked to functional textiles	BASICS OF FUNCTIONAL TEXTILES, COMMON PREPARATION METHODS AND RECENT INNOVATONS	EXPLAIN FUNCTIONAL TEXTILES AND THEIR PROPERTIES, IDENTIFY RECENT INNOVATIONS	OVERVIEW ON FUNCTIONAL TEXTILES PROPERTIES OF FUNCTIONAL TEXTILES INNOVATION IN FUNCTIONAL TEXTILES
ULO4- Resource efficient textile technologies for smart and functional textiles	TEXTILE PRINTING TECHNOLOGY	USE SUSTAINABLE TEXTILE PRINTING TECHNOLOGIES	OVERVIEW ON SUSTAINABLE TECHNOLOGIES FOR SMART AND FUNCTIONAL TEXTILES PRINTING TECHNIQUES FOR DEVELOPMENT OF SMART TEXTILES
ULO5- Integration of technologies to develop composites and electronic textiles (e-textiles)	TECHNIQUES FOR DESIGN, DEVELOPMENT, AND MANUFACTURING OF SMART TEXTILES	EVALUATE BEST PRACTICES TO PRODUCE SMART TEXTILES	 OVERVIEW ON TECHNIQUES OF ELECTRONIC TEXTILES BRIEF DESCRIPTION ABOUT FABRICATION METHODS STITCH, EMBROIDERY, ADHESION, COATING, CRIMPING, FUNCTIONAL FINISHING

Figure 14: Smart transition for managers and mentors microstructure and learning objectives

ASSESSMENT

Quizzes

Multiple-choice tests are included at the end of each video lecture. Fulfilment of these tests is required to obtain the certification; in the form of micro-credential.

Case studies

Case studies complement the video lectures. Each case study presents a description of the case; an activity for the learner and some questions to evaluate the fulfilment of the task. Work on case studies is also a requirement to obtain the certification; in the form of micro-credential.

MICRO-CREDENTIALS

The concept of micro-credentials

What are micro-credentials? Micro-credentials certify the learning outcomes of shortterm learning experiences, for example a short course or training. They offer a flexible, targeted way to help people develop the knowledge, skills and competences they need for their personal and professional development.

How are micro-credentials implemented in the European Union? On 16 June 2022, the Council of the European Union (EU) adopted a **Recommendation on a European approach to micro-credentials for lifelong learning and employability.** The Recommendation seeks to support the development, implementation and recognition of micro-credentials across institutions, businesses, sectors and borders.

Micro-credentials in AddTex

In the Smart, Digital and Green Skills Academy, built in the framework of the AddTex project, the approach of micro-credentials has been introduced to make the learning experience flexible and modular.

Micro-credentials make possible the targeted acquisition of knowledge, skills and competences to tackle current challenges and allow textile professionals to fill the skill gaps they need to succeed in a fast-changing environment, while not replacing traditional qualifications.

Micro-credentials will be released to the users upon completion of each module and related assessment test.



MOOC TRAINING

In an era of continuous changes and adoption of new technologies and concepts there is an increasing need of the people that work or intend to work in the textile sector to fill their educational gaps and improve their knowledge and skills. The aim of the MOOC developed by the consortium of ADDTEX project is to address these needs relating to Green, Digital and Smart technologies.

The identification of the specific needs i.e. innovations, challenges and opportunities that the textile industry as well as HEI and VET providers face was based on a gap analysis that included desk and field research that started in 2022 and was conducted in Czeck Republic, Germany, Greece, Ireland, Italy, Portugal, Romania, Slovenia, Spain and Sweden. The gap analysis brought together the findings of the ADDTEX partners, 272 Textiles companies, 47 VET providers and 55 HEIs.

The range of methodologies employed, successfully unearthed complex challenges facing the textile industry in relation to sustainable practices and circularity, smart systems and digital tools and technologies innovating the sector.

Companies that participated in the research provided insights into the challenges and recognized opportunities relating to Green, Digital & Smart technologies, identifying areas in which innovations and impact can be achieved through learning and training.

As a result of the gap analysis, a digital skills and sustainability skill academy (curricula), three training modules with 45 units of learning outcomes (ULOs) and a variety of educational resources were developed, with three concrete objectives:



The training contents were developed by the following partners/educational organizations:

- CITEVE Technological Center for the Textile and Clothing Industry of Portugal,
- INCDTP National Research and Development Institute for Textiles and Leather, Romania.
- PIN Soc.Cons. A R.L. Educational and Scientific Services for the University of Florence, Italy,

- TITERA Innovative Technologies, Slovenia,
- TUS Technological University of the Shannon: Midlands Midwest, Ireland,
- UB University of Boras, Sweden, and
- UPC Polytechnic University of Catalonia, Spain

Description of the courses

Based on the current situation of textile industries and the education system, the partnership developed courses on three defined modules/topics and gaps related to them.

- Module 1: Green transitions
- Module 2: Smart transitions
- Module 3: Digital transitions

Under each module, three tracks of trainees profile are addressed:

- 1. Engineers and Professionals
- 2. Technicians (active workers) and Graduates
- 3. Managers and Mentors


The 9 short innovative training courses designed and developed by ADDTEX consortium represent a sort of Academy where students, trainees and workers in textiles can complement and /or upskill with digital, smart, and green skills and knowledge. All courses are delivered through Massive Open Online Courses (MOOCs). The contents/units of the modules were decided by the ADDTEX consortium in a brainstorming session, each partners contributing with its expertise.



Each course comprises 5 units/lectures for each group of trainees. All 45 lectures are based on video tutorials (accessible through smartphone, computer or tablet) equivalent to 1h student study time (average 15 mins video lectures, 15 mins course materials and 30 mins self-study) which result in learning outcomes in terms of skills and knowledge. They are completed with quizzes and case studies. Each course may be standalone or combined into larger credentials. They can easily be aligned to National Qualification Frameworks (NQFs) and the European Qualifications Framework (EQF) thanks to the defined level standards for describing learning outcomes. Each module has a knowledge acquisition assessment test which leads to certification.

All training materials are available through an easily accessible and user friendly platform.

	Technic	ians & Graduates	
	Green Transitions	Digital Transitions	Smart Transitions
General description of the short	This short learning course covers the terms and	This course covers some core concepts of	This short learning course covers the terms and
course	definitions to understand green transition in	digitalisation in industry and some of the key	definitions of smart transitions in textile
	textile industries, as well as an overview of the	enabling technologies for this process. The aim	industries and their evolution in time and
	sustainable textile materials and processes and	of the course is to upskill technicians and	technologies, The aim of the course is to upskill
	their environmental impact evaluation. The	graduates with digitalisation knowledge for the	technicians and graduates with knowledge
	aim of the course is to upskill technicians and	new challenges of the digital transition of the	related to fundamental processes and material
	graduates with green textile knowledge for the	textile industry. It is organised in five topics, as	development in the domain of smart textiles.
	new challenges of the green transition of the	follows:	The course contains five units dealing with the
	textile industry. The course contains five units		following topics:
	dealing with the following topics:	 Digital Maturity, New Business 	
		Models, Data Acquisition and	Smart Textiles: introduction and
	 Understanding green transition 	Visualisation	challenges
	 Raw materials for green transition 	 Data Analytics and Artificial 	 Innovation linked to smart textiles
	 Fibre-to-fibre textile recycling 	Intelligence	 Innovation linked to functional
	Technologies for a resource-efficient	Smart Maintenance, Smart Industrial	textiles
	manufacturing	Control Systems	Resource efficient textile technologies
	• Evaluating environmental impact of	Collaborative Robotic Systems, &	for smart and functional textiles.
	the textile industry	Digitalisation of Production	Integration of technologies to develop
		 Marketing and Communication 	composites and electronic textiles
Identification of the learner	Technical VET or Bachelor students,	Technical VET or Bachelor students, graduates	Technical VET or Bachelor students, graduates
	graduates or workers with basic knowledge	or workers with basic knowledge in textile	or workers with basic knowledge in textile
	in textile technology, engineering or design,	technology, engineering or design, garment	technology, engineering or design, garment

	Technic	ians & Graduates	
	Green Transitions	Digital Transitions	Smart Transitions
	garment production, chemical engineering	production, chemical engineering and	production, chemical engineering and
	and processes, process technology or	processes, process technology or similar.	processes, process technology or similar.
	similar.		
Prerequisites needed to enroll in	Basic knowledge of industry and textile	Some basic knowledge of industry and business	Basic knowledge of industry and textile
the learning activity	materials and processes.	terminology, logistics, supply chains and	materials and processes.
		related technologies. Familiarity with e-	
		learning envinroments and computer assisted	
		courses. Basic IT and digital skills.	
National workload needed to	The short course consists of 5 lessons for a	The short course consists of 5 lessons for a total	The short course consists of 5 lessons for a total
achieve the learning outcomes (in	total of 5 hours of learning.	of 5 hours of learning.	of 5 hours of learning.
ECTS credits, where possible)	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:
	 15 mins video lectures 	 15 mins video lectures 	 15 mins video lectures
	 15 mins course materials 	 15 mins course materials 	 15 mins course materials
	 30 mins self-study 	 30 mins self-study 	 30 mins self-study
Type of assessment	Multiple Choice Quizzes (MCQ) after each unit	Multiple Choice Quizzes (MCQ) after each unit	Multiple Choice Quizzes (MCQ) after each unit
	Case study as final assessment	Case study as final assessment	Case study as final assessment
Form of participation in the	Lecture – Video based (MOOC)	Lecture – Video based (MOOC)	Lecture – Video based (MOOC)
learning activity (Learning	Online supporting materials	Online supporting materials	Online supporting materials
approach)			
Occupations related/	Textile industry technical occupations like	Textile industry technical occupations like	Textile industry technical occupations like
Work/professional environment	textile chemist, textile dyer, textile printer,	textile chemist, textile dyer, textile printer,	textile chemist, textile dyer, textile printer,
	textile designer, textile technologist, textile	textile designer, textile technologist, textile	textile designer, textile technologist, textile
	colorist, textile quality technician, textile	colorist, textile quality technician, textile	colorist, textile quality technician, textile
	dyeing technician, clothing technologist,	dyeing technician, clothing technologist,	dyeing technician, clothing technologist,
	clothing CAD patternmaker or similar.	clothing CAD patternmaker or similar.	clothing CAD patternmaker or similar.
Estimated EQF level associable	Level 4-5	Level 4-5	Level 4-5

	Engineer	rs & Professionals	
	Green Transitions	Digital Transitions	Smart Transitions
General description of the short course	 This short learning course covers the concepts, eco-design strategies, and main environmental regulations to understand green transition in textile industries, as well as the main advances about sustainable textile materials and processes. The best practices for measuring environmental impact and introduction to Life Cycle Assessment (LCA) are also covered. The aim of the course is to upskill Engineers and professionals with green textile knowledge for the new challenges of the green transition of the textile industry. The course contains five units dealing with the following topics: Understanding green transition Fibre-to-fibre textile recycling Technologies for a resource-efficient manufacturing Evaluating environmental impact of the textile industry 	 This course covers some core concepts of digitalisation in industry and some of the key enabling technologies for this process. The aim of the course is to upskill engineers and professionals with digitalisation knowledge for the new challenges of the digital transition of the textile industry. It is organised in five topics, as follows: Digital Maturity, New Business Models, Data Acquisition and Visualisation Data Analytics and Artificial Intelligence Smart Maintenance, Smart Industrial Control Systems Collaborative Robotic Systems, & Digitalisation of Production Marketing and Communication 	 This short learning course covers the terms and definitions of smart transitions in textile industries and their evolution in time and technologies, The aim of the course is to upskill engineers and professionals with smart textile knowledge for advanced functional applications, challenges, and opportunities. The course contains five units dealing with the following topics: Smart Textiles: introduction and challenges Innovation linked to smart textiles Innovation linked to functional textiles Resource efficient textile technologies for smart and functional textiles. Integration of technologies to develop composites and electronic textiles.
Identification of the learner	Engineer students, graduates or workers with advanced knowledge in textile technology, engineering or design, garment production, chemical engineering and processes, process technology and similar.	Engineer students, graduates or workers with advanced knowledge in textile technology, engineering or design, garment production, chemical engineering and processes, process technology and similar.	Engineer students, graduates or workers with advanced knowledge in textile technology, engineering or design, garment production, chemical engineering and processes, process technology and similar.
Prerequisites needed to enroll in the learning activity	Advanced knowledge of industry and textile materials and processes.	Advanced knowledge of industry and textile materials and processes.	Advanced knowledge of industry and textile materials and processes.

	Enginee	rs & Professionals	
	Green Transitions	Digital Transitions	Smart Transitions
National workload needed to	The short course consists of 5 lessons for a	The short course consists of 5 lessons for a total	The short course consists of 5 lessons for a total
achieve the learning outcomes (in	total of 5 hours of learning.	of 5 hours of learning.	of 5 hours of learning.
ECTS credits, where possible)	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:
	 15 mins video lectures 	 15 mins video lectures 	 15 mins video lectures
	 15 mins course materials 	 15 mins course materials 	 15 mins course materials
	 30 mins self-study 	 30 mins self-study 	 30 mins self-study
Type of assessment	Multiple Choice Quizzes (MCQ)	Multiple Choice Quizzes (MCQ)	Multiple Choice Quizzes (MCQ)
	Case studies	Case studies	Case studies
Form of participation in the	Lecture – Video based	Lecture – Video based	Lecture – Video based
learning activity (Learning	Online supporting materials	Online supporting materials	Online supporting materials
approach)			
Occupations related/	Textile industry occupations like textile	Textile industry occupations like textile	Textile industry occupations like textile
Work/professional environment	engineer, textile researcher, textile product	engineer, textile researcher, textile product	engineer, textile researcher, textile product
	developer, textile designer or similar	developer, textile designer or similar	developer, textile designer or similar
Estimated EQF level associable	Level 5-6	Level 5-6	Level 5-6

	Mana	gers & Mentors	
	Green Transitions	Digital Transitions	Smart Transitions
General description of the short course	 This short learning course covers the concepts related to sustainability, eco-design strategies and EU regulations for green transition in textile industries, as well as an overview of the new trends on sustainable textile materials, textile recycling technologies and sustainable textile processes. The basics about environmental impacts related to textile materials and processes and traceability across all critical phases of textile processes are also covered. The aim of the course is to upskill Managers and mentors of the textile industry with green textile knowledge for the new challenges of the green transition of the textile industry. The course contains five units dealing with the following topics: Understanding green transition Fibre-to-fibre textile recycling Technologies for a resource-efficient manufacturing Evaluating environmental impact of the textile industry 	 This course covers some core concepts of digitalisation in industry and some of the key enabling technologies for this process. The aim of the course is to upskill managers and mentors with digitalisation knowledge for the new challenges of the digital transition of the textile industry. It is organised in five topics, as follows: Digital Maturity, New Business Models, Data Acquisition and Visualisation Data Analytics and Artificial Intelligence Smart Maintenance, Smart Industrial Control Systems Collaborative Robotic Systems, & Digitalisation of Production Marketing and Communication 	 This short learning course covers the terms and definitions of smart transitions in textile industries and their evolution in time and technologies, The aim of the course is to upskill managers and mentors with knowledge related to embracing smart textiles and innovative processes with the scope of implement/adapt at industrial level to attain compatibility with the 2030 Agenda for Sustainable Development. The course contains five units dealing with the following topics: Smart Textiles: introduction and challenges Innovation linked to smart textiles Innovation linked to functional textiles Resource efficient textile technologies for mart and functional textiles. Integration of technologies to develop composites and electronic textiles.
Identification of the learner	Industrial, Bachelor or MBA students or graduates or experienced workers in textile manufacturing or textile technology and	Industrial, Bachelor or MBA students or graduates or experienced workers in textile manufacturing or textile technology and	Industrial, Bachelor or MBA students or graduates or experienced worker in textile manufacturing or textile technology and
Description and data and the	processes.	processes.	processes.
Prerequisites needed to enroll in	Experience in textile industry management.	experience in textile industry management.	Experience in textile industry management.
the learning activity			

	Mana	gers & Mentors	
	Green Transitions	Digital Transitions	Smart Transitions
National workload needed to	The short course consists of 5 lessons for a	The short course consists of 5 lessons for a total	The short course consists of 5 lessons for a total
achieve the learning outcomes (in	total of 5 hours of learning.	of 5 hours of learning.	of 5 hours of learning.
ECTS credits, where possible)	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:	Each lesson lasts 1 hour student time:
	 15 mins video lectures 	 15 mins video lectures 	 15 mins video lectures
	 15 mins course materials 	 15 mins course materials 	 15 mins course materials
	o 30 mins self-study	 30 mins self-study 	 30 mins self-study
Type of assessment	Multiple Choice Quizzes (MCQ)	Multiple Choice Quizzes (MCQ)	Multiple Choice Quizzes (MCQ)
	Case studies	Case studies	Case studies
Form of participation in the	Lecture – Video based	Lecture – Video based	Lecture – Video based
learning activity (Learning	Online supporting materials	Online supporting materials	Online supporting materials
approach)			
Occupations related/	Textile industry manager, textile quality	Textile industry manager, textile quality	Textile industry manager, textile quality
Work/professional environment	manager, textile development manager,	manager, textile development manager,	manager, textile development manager,
	product owner, textile specialist and similar	product owner, textile specialist and similar	product owner, textile specialist and similar
	occupations.	occupations.	occupations.
Estimated EQF level associable	Level 5-6	Level 5-6	Level 5-6

Overview on learning approaches

For the delivering of the training, modern video format based on power-point presentations with audio-visual content was chosen for each unit/lesson as it is usually the main information-delivery mechanism for online courses.

Short duration presentations and narration by the instructors who are visible are elements used for the creation of the videos as proven to be more effective in terms of learning, gathering better the attention of the learner. A common template for the scripts, the power points and the videos was prepared for homogeneity reasons.

Scripts and ppt presentations were prepared by the responsible partners and then the videos were recorded following specific guidelines.

A specific ratio of words per minute and words per video were defined.

All video lectures start with a presentation of the speakers followed by a short introduction on the contents of the lesson and the explanation of the topics. The videos end with the presentation of the conclusions.



For each video lecture, there is an assessment by a multiple-choice test (minimum 80% correct) with possibilities of autocorrection and repetition until the achievement of 80% score for correct answers.

Evaluation for course completion for certification under EU/national qualification systems is foreseen, i.e separated certification for green, smart and digital as well as a combined certification if all three trainings are completed.

Resources

The development of the video-lectures was allocated to the different partners according to their expertise. The MOOCs (scripts, ppt presentations and videos) were reviewed by the partners involved in the consortium.



INTRODUCTION

The e-learning platform developed for the ADDTEX project is based on a market-leading Learning Management System (LMS). It enables the complete management of all aspects of an online learning environment, such as lessons, videos, reading material, assessment, scores and certification. It is a standalone and autonomous learning system, in the sense that it does not need any manual assessment and marking from instructors, so learners get their results as quickly as they progress in the courses. It also integrates seamlessly with the ADDTEX website, following the same visual identity and structure.

All courses in ADDTEX are made available for free, only demanding the creation of a user login and password from the learner. Users will have lifetime access to the courses, so they have no deadline to complete a course once they have started it, as well as keeping their access to all the available material even after completion.

CONTENTS

The ADDTEX e-learning platform hosts the nine courses proposed by the ADDTEX project: the three topics (Green, Smart and Digital Transition) aimed at the three target groups each, as explained in Chapter 4. Each Course has a main page, where the most relevant information about them are gathered. The learner can access a short overview of the course, the complete curriculum and the list of instructors for the course on this main page.



Figure 1: The main page for the "Smart Transition for Technicians and Graduates" course, where the "Overview" tab can be seen.

The "Curriculum" tab on this page will show the titles of the units of that course, as well as the titles for the items in each unit, such as videos, quizzes, or any other material. Any item that is not accessible yet, either because the learner is not registered or because they have not reached this stage of the course yet, will show up as still locked in this page.



Figure 2: An example of the "Curriculum" tab, where all the contents are still locked, since the user is not registered yet.

The next tab, "Instructor", will bring the information about the instructors that have developed or presented each one of the courses. The learner will be able to see a picture of each instructor, as well as a short bio.



Figure 3: An example of the "Instructor" tab, where information about the instructors for each course can be seen.

Once the learner has registered and started a course, they will be able to navigate through its various units using the content menu on the left, as well as checking their completion status and quizzes' performance.



Figure 4: The interface of the e-learning platform showing a video lesson, as well as the content menu on the left.

USER TUTORIAL

This section will provide a tutorial on how to use the e-learning platform, from registration to obtaining a certificate for the course.

Choosing a course

The learner is able to choose a course from the ADDTEX learning platform by clicking on the "Courses" tab on the main menu, at the top of the main page. From this main landing page, the learner will be able to pick any of the three learner profiles that best suits them, and then one of the three major topics within their expertise level: Green, Smart or Digital Transition.

The Smart, Digital and Green Skills Academy created in the framework of the AddTex project, Induses 9 short innovative training courses contributing to upskilling competencies in this through a MOOC and completed by case studies, have been created to respond to the need of textle workers to update and improve their knowledge, skills, and competencies to fill the pays between their formal education and training and the needs of a fast-changing labour market well as the current challenges in the textle industry. The charge is between their formal education and training and the needs of a fast-changing labour market well as the current challenges in the textle sector. The core idea behind the AddTex Academy was to design and develop short but significant and fexible learning experiences for textle professionals at different levels, which can complementary to the experience acquiled through formal education. Apart from that, the courses have been developed in a way to make it possible to integrate them easily into blended earning outcomes and contents of each course are differentiated according to three main and Graduates, Engineers and Professionals or Managers and Mentors. Pick the profile that best suits yourself from the options below and start your learning journey. Enjoy:	Smart, Digital and Green Skills	s Academy
textile workers to update and improve their knowledge, skills, and competencies to fill the gap between their formal education and training and the needs of a fast-changing labour market as well as the current challenges in the textile sector. The core idea behind the AddTex Academy was to design and develop short but significant and flexible learning experiences for textile professionals at different levels, which can be complementary to the experience acquired through formal education. Apart from that, the courses have been developed in a way to make it possible to integrate them easily into bended learning paths, which apply both work-based learning and/or flipped dassroom methodologes. The learning outcomes and contents of each course are differentiated according to three main target groups corresponding to different job profiles within the textile industry: Technicians and Graduates, Engineers and Professionals or Managers and Mentors.	The Smart, Digital and Green Skills Academy created in the framework of the AddTex project, includes 9 short innovative training courses contributing to upskilling competencies in the green, digital, and smart transition in the textle industry. The courses, delivered virtually through a MOOC and completed by case studies, have been created to respond to the need of	Already Registered? Log in here
The core idea behind the AddTex Academy was to design and develop short but significant and flexible learning experiences for textile professionals at different levels, which can be corresentation. Apart from that, the courses have been developed in a way to make it possible to integrate them easily into tended learning paths, which apply both work-based learning and/or flipped dasroom methodologies. The learning outcomes and contents of each course are differentiated according to three main larget groups corresponding to different job profiles within the textile industry: Technicians and Graduates, Engineers and Professionals or Managers and Mentors.	textle workers to update and Improve their knowledge, skills, and competencies to fill the gap between their formal education and training and the needs of a fast-changing labour market as well as the current challenges in the textle sector.	Login Username or email *
fiexbic learning experiences for textue professionals at different levels, which can be complementary to the experience acquired through formal education. Apart from that, the courses have been developed in a way to make it possible to integrate them easily into blended learning paths, which apply both work-based learning and/or flipped dasroom methodologies. Password * The learning outcomes and contents of each ocurse are differentiated according to three main larget groups corresponding to different (bot profiles within the textile industry: Technicians and Graduates, Engineers and Professionals or Managers and Mentors. Remember me Pick the profile that best suits yourself from the options below and start your learning journey. Enjoy! Login	The core idea behind the AddTex Academy was to design and develop short but significant and	Email or username
The learning outcomes and contents of each course are differentiated according to three main target groups corresponding to different job profiles within the textile industry: Technicians and Graduates, Engineers and Professionals or Managers and Mentors. Pick the profile that best suits yourself from the options below and start your learning journey. Enjoy! Lost your password?	Textile learning experiences for textile professionals at different levels, which can be complementary to the experience acquired through formal education. Apart from that, the courses have been developed in a way to make it possible to integrate them easily into blended learning oaths, which apply both work-based learning and/or floped dassroom methodologies.	Password * Password
Pick the profile that best suits yourself from the options below and start your learning journey. Enjoy! Lost your password?	The learning outcomes and contents of each course are differentiated according to three main larget groups corresponding to different job profiles within the textile industry: Technicians and Graduates, Engineers and Professionals or Managers and Mentors.	C Remember me Login
	Pick the profile that best suits yourself from the options below and start your learning journey. Enjoy!	Lost your password?

Figure 5: The landing page for the courses, where the learner can choose their profile.



Figure 6: The list of courses available for the "Technicians and Graduates" profile.

Subsequently, clicking on any of the icons will bring them to the main page of the chosen course.

Enrolling in your first course

Once the learner has chosen one of the courses, the next step is to create login credentials and enrol themselves in that course. This can be done by clicking on the "Start Now" button at the top right corner of the main page of a given course.



Figure 7: Course main page, with the "Start Now" button highlighted.

When it is the first time a learner is enrolling in a course, they should click the "Sign up" link right below the login form, highlighted in the following screenshot:

	Home About - Resou	irces Courses H	ious contact us () in	y 0	
	Checkout				
lo payment method is available.					
	Please log in to enroll in the course!				
	Sign in	Your ord	er		
	Username or email * Email or username		Smart Transition for Technicians and Graduates	€0.00	
	Password *	Subtotal		€0.00	
	Remember me	Total sword?		€0.00	
	Don't have an account? Sign up				
	Note to administrator				
	Place Order				
8	by compressing your purchase you agree to those term Conditions.				

Figure 8: The "Checkout" screen when enrolling into a course, with the "Sign up" option highlighted for first-time users.

The sign-up form will show up for the user, where they can enter their personal details.

IMPORTANT: Make sure to fill in your First Name, Last Name and Display Name properly in the form, as these will be used in the certificate of completion for the course. "Display Name" should be your full name (first name followed by surname(s)).

	AddTex	Home About - Resources	Courses HUB	S Contact us 👩 i	n 🌶 🖸
	Home > Checkout				
No payment method is available.					
	Please log in to enroll in the course!				
	Sign up Email address *		Your order		
	Email			Smart Transition for Technicians and Graduates	€0.00
	Username *		Subtotal		€0.00
	Password *		Total		€0.00
	Password	۲			
	Confirm Password *				
	Password	۲			
	First name				
	Last name				
	Last name				
	Display name				
	Display name				
1	Company *				

Figure 9: The sign-up form, to be filled when the learner is enrolling in a course for the first time.

Once the form is filled, the learner should click on the "Place Order" button at the bottom of the page to submit their details. This will lead them to a confirmation page, depicted in the following figure.

🕅 🚳 AddTex	NONDAR	Howdy, Disp	olay Name 📃 🛛 🤇
	AddTex	Home About - Resources Courses HUBS Contact us () in 🎔 🐵	
	Home > Checkout		
	Checkout		
No payment method is available.			
	Thank you. Your order has been received.		
	Order Number	#000002736	
	Status	Completed	
	Item	Smart Transition for Technicians and Graduates (#1412)	
	Date	December 14, 2023	
	Total	60.00	
	Co-funded by		
	the European Union		
	Project n°101056303 – Advancing industri Funded by the European Union. Views and Education and Culture Executive Agency (t	al digital and green innovations in the advanced testile industry through innovation in learning and training. opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European ACEX), Neither the European Linion nor the granting authority can be held responsible for them."	
		© All rights reserved 2023 – Phracy Policy	

Figure 10: The confirmation page for the course enrolment.

Clicking on the name of the course (in orange) on this page will bring the learner to its main page. Now that the learner is logged in and enrolled into that course, the "Start Now" button is gone and a "Continue" button takes its place, as well as statistics about their course progress. A black bar can also be seen at the top of the screen, meaning that the user is logged in. Clicking on the "Howdy <Display Name>" will show the "Edit Profile" and "Log Out" options.

🕅 🙆 AddTex					Howdy, Display Name 🌅 🍳
	AddTex	Home About • Resources	Courses HUBS Contact us	() in y ©	
	Home > All Courses > Technicians and C	Graduates > Smart Transition for Technicians	and Graduates		
	Addtex Learning				
	Smart Transition f	or Technicians and (Graduates		
		_		Continue	
	Overview	Curriculum	Instructor	Lessons completed: 0/5	
	IMPORTANT: Don't click "Start Now" previous progress. Instead, log into th continue it.	if you have already started this course, as the platform using the form on the "Course	reordering the course will <u>erase</u> your s" page and go to "My Courses" to	Quizzes finished: 0/5 Course progress: 0%	
	Smart Transition in th and Graduates	e Advanced Textile Indu	stry for Technicians		
	This course will cover some core concept enabling this process. It is organised in fi	ts of the smart transition in the textiles indus ive topics, as follows:	try and some of the key technologies		
	 Smart textile: Introduction and chal Innovations linked to smart/intellig Integration of technologies to deve Resource efficient textile technolog Innovations linked to functional tex 	llenges ent textiles elop composites and electronic textiles jes for smart and functional textiles ttiles			
	After each module (ULO) there will be a certificate.	short quiz. You must get a score of 80% or hi	gher on the quizzes to earn your		
	Enjoy!				

Figure 11: The main page of a course when the learner is logged in.

Continuing a course after enrolment

When a learner has already enrolled themselves in a course, the path to access its contents is slightly different, since now they can just use the platform login form. They can do so by clicking the "Courses" tab on the main menu, and the login form will be available in case they are not logged in yet (see Figure 5). Logging into the platform brings them to the profile page, where they can see and edit their personal information, as well as the list of courses they are currently enrolled in.



Figure 12: A screenshot from the user profile page.

Clicking in any of the courses on the "My Courses" list will allow the learner to continue their progress on that course. They can also browse all the other courses available by clicking on the link to the "Courses" page at the top.

IMPORTANT: Don't click "Start Now" in a course that you have already started, as reordering the course will erase your previous progress. Instead, log into the platform using the form on the "Courses" page and go to "My Courses" to continue it.

Watching video lessons

'Once the learner is logged in and enrolled in the course, they can start watching the video lessons and taking the quizzes in sequence. The following topic or content in the course will not be available unless the current one is finished. All courses have at least one video lesson and one quiz for each ULO.

IMPORTANT: After finishing watching a video, the learner should click the "Complete" button at the bottom of the page, so they can have access to the next piece of content in the course.



Figure 13: The video lesson interface, with a highlight on the "Complete" button.

When watching a video lesson, the learner can skip straight into a specific topic by clicking on the "chapter list" or the individual round timeline indicators at the bottom of the player. Traditional video playback options such as pause, fast forward, rewind and speed controls are also available at the player.



Figure 14: A screenshot of a video lesson with the chapter list available.

Taking a quiz

After each video lesson of a course there will be a short quiz with five single choice questions, in order to assess the learning outcomes related to that specific unit. As soon as a video is checked as complete by the learner, the corresponding quiz is automatically made available. The learner has 15 minutes to complete the quiz, and a minimum score of 80% is needed for a passing grade. The quiz can be retaken two more times in case the learner does not pass it on the first attempt.

🔞 🚳 AddTex		
Search for course content	Q	Digita To Press F11 to exit full screen that es 3 al follows
ULO2 - Data Acquisition, Visualisation And Analytics	^	
		Quiz: ULO2 – Data Acquisition, Visualisation and Analytics
ULO3 - Smart Maintenance, Smart Industrial Control Systems	1	Cuestion 1 to 5 2 14:52 FINISH QUIZ
Video: Smart Maintenance, Smart Industrial Control Systems: Technicians and Graduates	•	1. Question 1
Quiz: ULO3 - Smart Maintenance, Smart Industrial		Data analytics is useful for:
Control Systems 15 minutes 5 questions		Development of superconductive textiles.
ULOA Collaboration Datastic Systems And		Business optimization and maximizing profit.
Digitalisation Of Production	^	Personal data anonymization.
Video: Collaborative Robotic Systems and		Selecting the adequate experimental design.
Digitalisation of Production: Technicians and Graduates		
Quiz: ULO4 - Collaborative Robotic Systems and		2. Question 2
Digitalisation of Production 15 minutes 5 questions		How many types of data analytics are used?
		6 data analytics such as diagnostic, augmented, prescriptive, predictive, descriptive, and real-time.
ULO5 - Digital Marketing And Communication	•	3 data analytics such as insertion, selection and integration.
Video: Digital Marketing and Communication:		Are used 2 types of analytics such as comparative and critical.
Technicians and Graduates	1	There are used 2 types of analytics discrete and continuous.
Quiz: ULO5 - Digital Marketing and		
15 minutes 5 questions		< Prev Next

Figure 15: A screenshot from one of the quizzes, showing the remaining time and "Finish Quiz" button at the top.

At the end of a quiz the learner will click on "Finish Quiz" to get their results. Once finished, the learner is presented with the options to retake the quiz or review their answers. When reviewing the answers, the learner can see the right answer to all the questions of the quiz, as well as a brief description of where in the material to find the topic(s) related to each question.

AddTex			
earch for course content	Q		
ILO1 - Digital Maturity And New Business Models		Quiz: ULO1 – Digital Maturity and New Business Models	
LO2 - Data Acquisition, Visualisation And nalytics		100%	
Video: Data Acquisition, Visualisation and Analytics: Technicians and Graduates		\smile	
Quiz: ULO2 - Data Acquisition, Visualisation and Analytics 15 minutes 5 questions	•	Passed	0:01:42
LO3 - Smart Maintenance, Smart Idustrial Control Systems		Points Questions	5/5
Video: Smart Maintenance, Smart Industrial Control Systems: Technicians and Graduates		Correct Wrong Skipped	0
Quiz: ULO3 - Smart Maintenance, Smart Industrial Control Systems		Minus points	0
15 minutes 5 questions JLO4 - Collaborative Robotic Systems And Digitalisation Of Production		Retake (2) Review	
Video: Collaborative Robotic Systems and Digitalisation of Production: Technicians and Graduates			
		* Prev	Next *

Figure 16: An example of a completed quiz screen.

Completing a course

When a learner has successfully completed all the lessons and the case study, as well as having achieved at least 80% scores in all the quizzes, they are considered to have successfully completed the course.



Figure 17: A screenshot of a successfully completed last quiz of a course, with the "Finish Course" button at the top of the page.

In this situation, a "Finish Course" button appears at the top of the screen, and when clicked the learner will be presented with their completion certificate.



Figure 18: The certificate of completion.

The certificate has a QR code for authenticity check, and can be downloaded by clicking on the icon right below it. Also, once the course is finished the "Continue" button gives place to a "Certificate" button that can be accessed at any time. It is also made available in the user profile page. In order to access again the course materials, the learner can go to the "Curriculum" tab.

I forgot my password.	Go to the "Courses" page, click the "Lost password?" link under the login form. Insert your email or username, and you will receive a password reset link. IMPORTANT: the email might end up in your spam folder.
I cannot sign up to the platform.	Try checking if your password and the "confirm password" fields are matching on the form, and that all required fields are filled. Also, names or surnames with special characters may not be accepted.
I cannot access the next topic of the course I am taking.	Double check that you have checked the current lesson as complete, or that you have achieved a score of at least 80% in the previous quiz.
I have finished all the quizzes, but the "Finish Course" button does not show up.	Make sure that you have achieved at least an 80% score in all the quizzes. Retake the failed ones, if needed.
I have forgotten to download my certificate when I finished the course.	You can access your certificate again by logging into the platform and scrolling down on your profile page. There will be a "Certificates" section on the left. You can also, while logged in, navigate to the main page of the course, where a "Certificate" button will be available.

TROUBLESHOOTING



ABBREVIATIONS, DEFINITIONS AND BOUNDARIES

Explanation of the technical abbreviation used in the book:

WP	Work Package	
MOOC	Massive Open Online Courses	
HEIs	Higher Educational Institutes	
VET	Vocational Education and Training	
VUCA	Volatile, uncertain, complex, and ambiguous	
Micro-credentials	Micro-credentials offer a flexible, targeted way to help people develop the knowledge, skills and competences they need for their personal and professional development. In the Smart, Digital and Green Skills Academy, which was set up as part of the AddTex project, the micro-credentials approach was introduced to make the learning experience flexible and modular.	

Definition of basic terms used in the book:

□ The aim of the MOOC, developed by the consortium of the ADDTEX project, is to meet the current needs of the textile industry with a focus on technical textiles and in relation to green, digital and smart technologies.

□ Knowledge, skills and competencies can be updated and improved individually and according to the level of knowledge.

THE THREE TARGET GROUPS:

Technicians and Graduates: Professionals or technicians who have specialized technical training or expertise in the field of textiles, but may have no or a university degree.

Engineers and Professionals: Professionals with an academic textile education in engineering or a related field with advanced knowledge and skills.

Managers and Mentors: Managers who are responsible for the structured management of teams and projects and have organizational tasks, as well as experienced professionals who support others in their professional development.
THE THREE MAIN THEMES:

Smart

Smart textiles, also known as smart or connected textiles, are materials that combine textile properties with electronic components to enable additional functions or applications. Terms and definitions as well as temporal and technological development are taught. The aim of the course is to gain knowledge of the basic processes and material development in the field of intelligent textiles.

Digital

The integration of digital technologies in the textile industry is explained and the potential of the use of digital technology, especially to streamline processes, increase productivity and create new opportunities. This course will cover some core concepts of digitalization in industry and some of the key technologies for this process, providing in-depth digitalization knowledge for the new challenges of digital transformation in the textile industry.

Green

'The focus is on understanding the green transition in the textile industry as well as an overview of sustainable textile materials and processes and their assessment of environmental impact. Knowledge about green textiles will be imparted for the new challenges of the green transition in the textile industry.

LIMITATION AND BOUNDARIES OF THE CONTENTS DISCUSSED IN THE BOOK:

The identification of the specific needs for the textile industry as well as HEI and VET providers face was based on a gap analysis that included desk and field research that started in 2022 and was conducted in Czeck Republic, Germany, Greece, Ireland, Italy, Portugal, Romania, Slovenia, Spain and Sweden. The gap analysis brought together the findings of the ADDTEX partners, 272 Textiles companies, 47 VET providers and 55 HEIs.

The range of methodologies employed, successfully unearthed complex challenges facing the textile industry in relation to sustainable practices and circularity, smart systems and digital tools and technologies innovating the sector. The knowledge imparted in the training courses is based on the findings from 2022.





DISCLAIMER:

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