Intellectual output 1: IO1-A4

BUILDING BRIDGES FOR CIRCULAR ECONOMY BY FOSTERING YOUTH ENTREPRENEURSHIP

Curriculum

November 2021

SUMMARY [ENG]

Building Bridges for Circular Economy by Fostering Youth Entrepreneurship is an Erasmus+ project, highlighting the importance of youth involvement in the fields of Green Entrepreneurship (GE) and Circular Economy (CE) business opportunities. This document in front of you was prepared within Intellectual output 1. A joint curriculum was developed for CE and GE online modules, including information on description of learning outcomes, description of competencies gained, teaching effects, number of hours assigned to each module, type and methods of learning, methods of evaluation of competencies gained. In detail, the prepared curriculum presents two modules: module 1 on Green Entrepreneurship and module 2 on Circular Economy, to foster mind-sets ready to develop career opportunities through innovative training/learning approaches and methodology within the developed e-course from the Intellectual output 3.

RÉSUMÉ [FR]

Building Bridges for Circular Economy by Fostering Youth Entrepreneurship est un projet Erasmus+, qui souligne l'importance de l'implication des jeunes dans les domaines de l'entrepreneuriat durable (GE) et des opportunités commerciales de l'économie circulaire (EC). Le document que vous avez devant vous a été préparé dans le cadre de la première production intellectuelle. Un curriculum commun a été développé pour les modules en ligne de l'EC et du GE, comprenant des informations sur la description des résultats d'apprentissage, la description des compétences acquises, les effets de l'enseignement, le nombre d'heures attribuées à chaque module, le type et les méthodes d'apprentissage, les méthodes d'évaluation des compétences acquises. En détail, le programme préparé présente deux modules: le module 1 sur l'entrepreneuriat durable et le module 2 sur l'économie circulaire, afin de favoriser des mentalités prêts à développer des opportunités de carrière par le biais d'approches et de méthodologies de formation/apprentissage innovantes dans le cadre du cours en ligne développé à partir de la troisième production intellectuelle.

ΠΕΡΙΛΗΨΗ [GR]

Το πρόγραμμα "Building Bridges for Circular Economy by Fostering Youth Entrepreneurship " είναι ένα έργο Erasmus+, το οποίο αναδεικνύει τη σημασία της συμμετοχής των νέων στους τομείς της πράσινης επιχειρηματικότητας (GE) και των επιχειρηματικών ευκαιριών της κυκλικής οικονομίας (CE). Το παρόν έγγραφο που βρίσκεται ενώπιόν σας εκπονήθηκε στο πλαίσιο του πρώτου παραδοτέου. Αναπτύχθηκε ένα κοινό πρόγραμμα σπουδών για τις διαδικτυακές ενότητες της Κυκλικής Οικονομίας και της Πράσινης Επιχειρηματικότητας, το οποίο περιλαμβάνει πληροφορίες σχετικά με την περιγραφή των μαθησιακών αποτελεσμάτων, την περιγραφή των αποκτηθέντων ικανοτήτων, τα αποτελέσματα της διδασκαλίας, τον αριθμό των ωρών που ανατίθενται σε κάθε ενότητα, τον τύπο και τις μεθόδους μάθησης, τις μεθόδους αξιολόγησης των αποκτηθέντων ικανοτήτων. Αναλυτικότερα, το πρόγραμμα σπουδών που εκπονήθηκε παρουσιάζει δύο ενότητες: την ενότητα 1 για την πράσινη επιχειρηματικότητα και την ενότητα 2 για την κυκλική οικονομία, για την προώθηση νοοτροπιών έτοιμων να αναπτύξουν ευκαιρίες σταδιοδρομίας μέσω καινοτόμων προσεγγίσεων κατάρτισης/μάθησης και μεθοδολογίας στο πλαίσιο του αναπτυγμένου ηλεκτρονικού μαθήματος από το τρίτο παραδοτέο.

REZUMAT [RO]

Construirea de punți pentru economia circulară prin promovarea antreprenoriatului verde este un proiect Erasmus+, care evidențiază importanța implicării tinerilor în domeniile antreprenoriatului verde (GE) și a oportunităților de afaceri în domeniul economiei circulare (CE). Acest document este produsul primului rezultat intelectual al proiectului. A fost elaborată o curriculă comună pentru modulele online de instruire, incluzând descrierea rezultatelor învățării, a competențelor dobândite, efectele predării, numărul de ore alocat fiecărui modul, tipul și metodele de învățare, și metode de evaluare a competențelor dobândite. În detaliu, curricula pregătită este împărțită în două module: Modulul 1 se axează pe Antreprenoriat Verde, iar Modulul 2 pe Economia Circulară, pentru a instrui tineri în dezvoltarea de oportunități de carieră prin abordări și metodologie inovatoare de formare/învățare în cadrul cursului digital dezvoltat din al treilea rezultatul intelectual.

POVZETEK [SI]

Grajenje Mostov za Krožno Gospodarstvo s Spodbujanjem Mladinskega Podjetništva je Erasmus+ projekt, ki poudarja pomen vpetosti mladih v poslovne priložnosti na področjih zelenega podjetništva (GE) in krožnega gospodarstva (CE). Dokument pred vami je bil pripravljen v okviru Intelektualnega rezultata 1. Pripravljen učni načrt je bil razvit za prostodostopen e-tečaj o načelih in uporabi konceptov CE in GE, ter obsega podatke o učnih izidih, opis pridobljenih kompetenc, o številu predvidenih učnih ur v e-modulu, tipu in izbranih metodah poučevanja ter pridobivanja znanja, postopkih vrednotenja pridobljenih kompetenc. Podrobneje, pripravljen učni načrt predstavi dva modula: modul 1 o zelenem podjetništvu in modul 2 o krožnem gospodarstvu, za spodbujanje miselnih vzorcev za razvoj kariernih priložnosti skozi inovativne izobraževalne pristope in metodologije v oblikovanem e-tečaju znotraj Intelektualnega rezultata 3.

1. INTRODUCTION

More than 3.3 million young people (aged 18-28 years) were unemployed in EU in 2019. The situation even worsened with the COVID19 crisis and in post-COVID times. Furthermore, the Commission discussed the importance of the circular economy (CE), bringing major economic benefits, contributing to innovation, growth, and job creation. Circular economy encourages sustainability and competitiveness in the long term, and helps saving costs for European industries, unlocking new business opportunities, and creating local low and high-skilled jobs.

Therefore, entrepreneurship education makes a difference: within alumni those who participated in any entrepreneurship training are 5 times more willing to start entrepreneurship activities. However, currently youth education mostly addresses basic competencies and knowledge of entrepreneurship and business.

Moreover, we have perceived that a huge share of these options is based on formal educational approaches, not introducing youth e.g., how to develop the CE and green entrepreneurship idea and actually survive on the market. Green entrepreneurship (GE), non-profit activities and circular economy (CE) are interlinked. The importance of CE is continually increasing when creating new green jobs, youth entrepreneurship opportunities and a more inclusive economy, and therefore bringing social benefits. However, all the partners are NGOs and non-profit surviving at the market with innovative business models and will transfer our knowledge and experiences into youth trainings and help them establish their own entrepreneurship.

Building bridges for circular economy by fostering youth entrepreneurship proposal aims to enhance CE knowledge, GE skills and mind-sets by youth to develop career opportunities through innovative training/learning approaches and methodology. A curriculum developed for CE and GE online modules, including information on description of learning outcomes, description of competencies gained, teaching effects, number of hours assigned to each module, type and methods of learning, methods of evaluation of competencies gained, information will be presented in this document.

2. METHODS and APPROACHES

IO1-A4: joint curriculum represents combined research of materials and results, prepared in IO1: desk research (national state-of-the-art reports on legal framework and educational offers per partner countries) and field research (competencies questionnaire for youth). Previous project activities within Intellectual output 1 were used to identify current knowledge and competence lacking in countries covered in project and to serve in preparation of topics in curriculum closely related to knowledge, skills and competences to be gained by curriculum.

Bloom taxonomy

Bloom taxonomy has been applied to create learning objectives and outcomes of the curriculum. Bloom's Taxonomy was created in 1956 by the leadership of educational psychologist Dr Benjamin Bloom to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts (rote learning). It is widely used as a template for creating curriculums learning objectives and outcomes as it is a convenient way for describing the extent to which we want for the students to understand and use concepts, to demonstrate particular skills, and to have their values, attitudes, and interests covered.

There are three domains educational activities or learning (Bloom, et al. 1956) which were revised by Anderson and Krathwohl (2001) and are used today, as such:

- Cognitive: mental skills (knowledge).
- Affective: growth in feelings or emotional areas (attitude or self).
- Psychomotor: manual or physical skills (skills).

The cognitive field involves the knowledge and development of an individual's intellectual abilities, which involves recalling or recognizing certain facts, procedural patterns, and concepts that serve to develop intellectual skills and abilities. Bloom (1956) form six levels within this category and assumed that the higher level cannot be obtained until the lower levels of learning and teaching are acquired, Fig. 1. We have used these levels of education to serve us as a support in curriculum design and evaluation, as suggested by Forehand (2008). Updated terms and their definitions of cognitive levels in the Bloom taxonomy, according to Anderson and Krathwohl (2001):

- **Remembering**: renew, recognize, recall knowledge from memory;
- **Understanding**: design meaningful oral, written or graphic messages with explanation, case studies, classification, summaries, conclusions, comparison and explanations;
- **Applying**: carry out procedures;

- **Analyzing**: break down into individual parts and determine the connections of individual parts into a complete composition, by distinguishing organizing or defining a function;
- **Evaluating**: make judgments based on criteria and standards by examination and criticism;
- **Creating**: assemble elements in such a way that they form a comprehensive useful set, recognize elements into something new, a new structure, by designing or producing new knowledge.

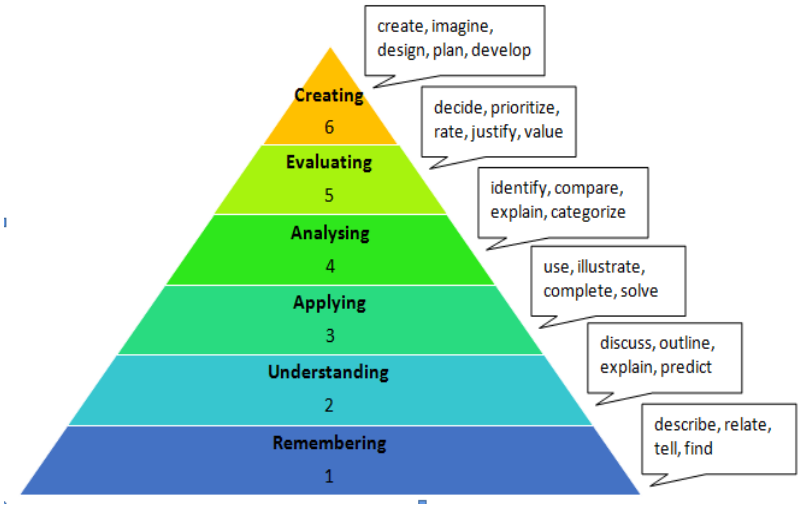

Figure 1: Bloom Taxonomy of Educational Objectives hierarchy (Ref.)[1]

Current research reveals the widespread use of the Bloom's taxonomy in various fields (e.g. from chemical engineering to medicine). Bloom's improved taxonomy has fostered those educational concepts that related to problem solving and to creative and critical thinking, through the integration and use of information and communication technology (Ferguson, 2002). For the preparation of the curriculum, we followed the improved Bloom's taxonomy as creative approaches and critical thinking are of utmost importance in the circular economy, and green entrepreneurship education as well as in generating new business ideas.

IO1-A4 methods and approaches

Methodology and guidelines for the task IO1-A4 were developed by IO1 leader, MIITR. Based on the templates and framework provided, regarding previous project activities within IO1, partners conceptualize the curricula. Meaning define competencies, learning outcomes, learning methods, literature used, content and all other requirements via online meetings discussion. Curriculum was

[1] Ref: Bloom, B. S. (ed.). Taxonomy of Educational Objectives. Vol. 1: Cognitive Domain. New York: McKay, 1956.

firstly developed in English languages, while partners will carry out the adoption of the curriculum in their national languages.

IO1-A4: joint curriculum will represent a baseline for IO3 development of a e-modules and e-book content, in a line with the learning needs of our main target groups, youth between 18-28 years old. Curriculum will therefore cover circular economy (CE) principles, circular economy business models, green entrepreneurship, practical guidance for establishing green entrepreneurship business, ….

3. JOB PROFILE

Based on the previous project activities within Intellectual output 1, regarding desk and field research, as well as our future work within Intellectual output 3, where we will prepare the training materials and content, we designed a suitable job profile with all the relevant, applicable and corresponding descriptions and expected learning outcomes. In order to harmonize the curricula for all participant countries, we considered the European Qualification Framework (EQF), an 8 level learning outcomes-based framework for all types of qualifications that serves as a translation tool between different national qualifications frameworks The entry requirement for the Green Entrepreneur Job profile is the EQF Level 4, meaning secondary education diploma.

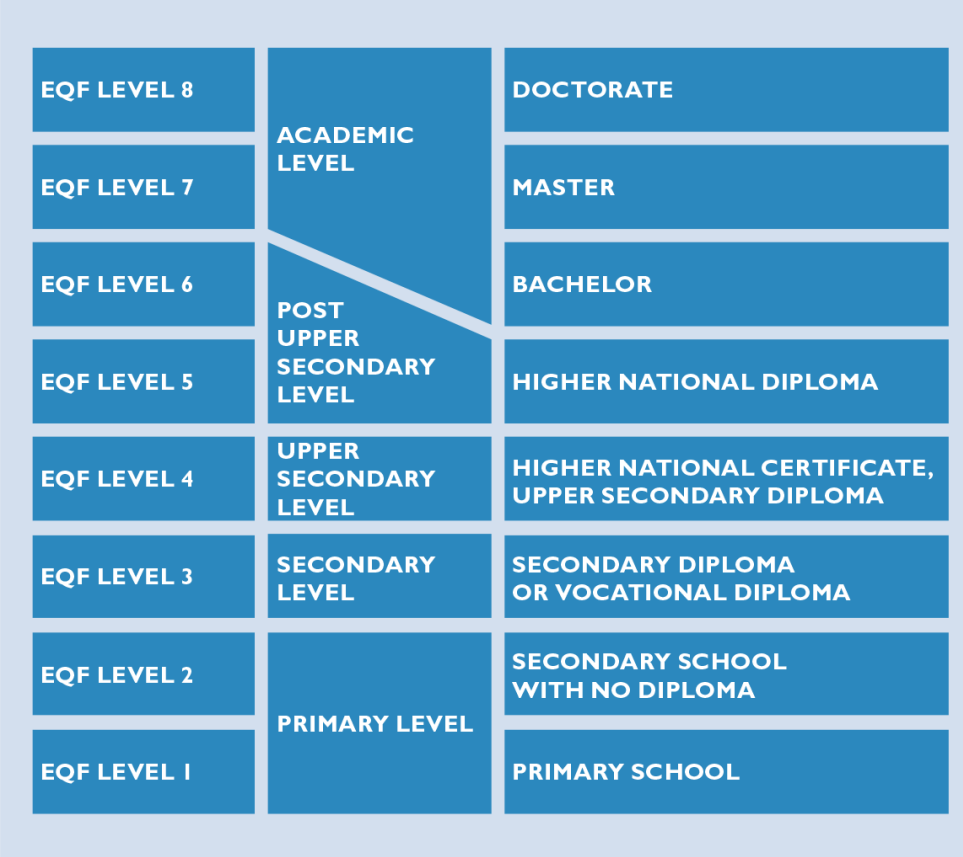

Figure 2: European Qualification Framework in comparison to the achieved educational levels (Ref.)[2]

[2] Ref: https://www.maintworld.com/R-D/Application-of-European-Qualification-Framework-EQF-in-Maintenance

Job Title	**GREEN ENTREPRENEUR**
EQF Level	Level 4
Job description	A green entrepreneur considers environmental, economic and social axes in core businesses, provides innovative solutions to the way goods and services are produced and consumed, and proposes a business model which contributes to the greening of the economy[3].
Activities	1. Analyze the context, opportunities and threats within GE 2. Identify market needs and opportunities in its area of expertise 3. Identify the green business idea 4. Apply green methods, tools and business models 5. Understand stakeholders and cooperate with them 6. Create a GE business plan 7. Manage finance and assess financial opportunities 8. Promote its business as an added value 9. Evaluate risks within business and on the market
Entry requirements	**EQF level 3 completed - secondary diploma or vocational diploma** Knowledge of facts, principles, processes and general concepts, in a field of work or study. A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems

[3] SweechMed 2015 - The Handbook for Green Entrepreneurs in the Mediterranean

	Computer applications **Level 4 completed - Higher national certificate/upper secondary diploma (high school)** Factual and theoretical knowledge in broad contexts within a field of work or study A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

Expected skills, knowledge and competences

Skills

- Take initiative in the fields of CE and GE
- Maintain communication within the team, organization and with relevant stakeholders
- Adaptability and flexibility of human resources, business, products and services
- Identify value creation opportunities towards circularity in a business
- Ability to generate innovative and creative circular design solutions within GE

Knowledge

- Understand the context, opportunities and threats within GE
- Know about green methods and tools within GE management
- Understand the application of business models within CE and GE
- Knowledge on creating value in a circular economy business opportunities

General entrepreneurial competences

- Creative Thinking
- Networking
- Planning & Organizing
- Problem Solving & Decision Making
- Checking, Examining & Recording
- Business Fundamentals
- Computer Applications

CE and GE related competences

- Respond to complex challenges, considering principles of circular economy and green entrepreneurship
- Propose innovative method approaches to minimize the use of resources and materials within business processes
- Able to seize financial opportunities based on the CE or GE business idea and plan
- Evaluate and incorporate environmental (e.g., political, regulatory, market) and social factors when making strategic decisions, regarding CE or GE business
- Introduce, improve or adapt new solution in business, develop new business plan within CE and GE (carry out idea into realization)

4. E-COURSE

COURSE CARD

1. **Basics**

Name of course **CIRCULAR ECONOMY AND GREEN ENTREPRENEURSHIP FOR YOUTH**	**Exam (Yes/No)** NO
ECVET points: **3**	**Language** ENGLISH
E-course chapter distribution: E-MODULE 1 (40 hours): Green Entrepreneurship; Business plan in Green Entrepreneurship; Financing green business; Practical guidance for establishing Green Entrepreneurship business E-MODULE 2 (40 hours): Introduction to Circular Economy; Technical and biological cycles, Circular design; Circular Economy business models	
Duration: **80 hours**	**Mode of study (full time study / part time study)** FULL TIME STUDY / PART TIME STUDY

2. **Course content:**

- E-lectures, individual work guidelines, e-exercises

0.	Subject introduction and overview of topics
E-MODULE 1	
1.	Green Entrepreneurship
2.	Business Plan in Green Entrepreneurship
3	Financing Green Businesses
4.	Practical Guidance for Establishing Green Entrepreneurship Business
E-MODULE 2	
5.	Introduction to Circular Economy
6.	Technical and Biological Cycles
7.	Circular Design
8.	Circular Economy Business Models

3. **Learning Outcomes**

The Learning Outcomes break down into knowledge, skills and competencies that are mobilized in actions/achievements through which the individual shows/demonstrates the required field of competence, according to a certain performance criteria and context conditions.

Learning Unit 1; Green Entrepreneurship

In this unit, background, definitions, the global context and added value of the green entrepreneurship are explained. The need for addressing social and environmental needs and challenges is presented. Good practice examples are described.

LEARNING UNIT 1	**GREEN ENTREPRENEURSHIP**
Sub-topics	Background and definition of GE Added value of addressing social and environmental challenges Good practice examples
Workload	10 hours
Main achievement	Learner understands the difference between normal and green business initiatives and is able to identify green business opportunities.
LEARNING OUTCOMES	
KNOWLEDGE	Understand the background and added value Recognize the difference between classical and green entrepreneurship Get to know green entrepreneurship principles
SKILLS	Respond creatively to the needs and problems within business and the community/environment
COMPETENCES	Respond to complex business challenges, using green entrepreneurship principles

Learning Unit 2; Business Plan in Green Entrepreneurship

In this unit, GE business plan is explained step by step. Based on good practice examples, creative thinking and innovative solutions are fostered, aiming to start designing a personalized business plan on their own.

LEARNING UNIT 2	**BUSINESS PLAN IN GREEN ENTREPRENEURSHIP**
Sub-topics	Key aspects of a GE business plan Business opportunities within GE Good practice examples
Workload	10 hours
Main achievement	Learner understands the steps on how to develop an innovative green business plan.
LEARNING OUTCOMES	
KNOWLEDGE	Get to know key elements in a business plan Recognize green entrepreneurship as a part of the successful, commercial application of innovations
SKILLS	Recognize competences needed for establishing successful innovative business
COMPETENCES	Recognize many forms of value that could be created through green entrepreneurship business plan, such as social, cultural, or economic value

Learning Unit 3; Financing Green Businesses

In this unit, practical explanations and advice is given, explaining how to seize financial opportunities within green entrepreneurship. Based on practical cases, overview of the basic elements of financing such business and key challenges are presented and solved.

LEARNING UNIT 3	**FINANCING GREEN BUSINESSES**
Sub-topics	Financial opportunities within GE Financial challenges of a green business Practical advice in GE financing
Workload	10 hours
Main achievement	Learner understands the main opportunities as well as challenges in financing green business.
LEARNING OUTCOMES	
KNOWLEDGE	Understand financial aspects of a green business Optimize business based on financial opportunities
SKILLS	Apply financial management skills into business
COMPETENCES	Able to seize financial opportunities based on a business idea and plan

Learning Unit 4; Practical Guidance for Establishing Green Entrepreneurship Business

This unit is a checkpoint for all the previously gained knowledge via above learning units, putting theory into practice. Clear and useful guidance is presented for understanding and applying circular economy principles and green entrepreneurship elements when starting a business.

LEARNING UNIT 4	**PRACTICAL GUIDANCE FOR ESTABLISHING GREEN ENTREPRENEURSHIP BUSINESS**
Sub-topics	Steps for establishing GE business Overview of the most important business factors Practical examples of good and bad business performance within GE
Workload	10 hours
Main achievement	Learner is able to use GE business idea in the real world.
LEARNING OUTCOMES	
KNOWLEDGE	Get to know important business factors within GE Assess business opportunities within green entrepreneurship Understands all steps when establishing GE business
SKILLS	Recognize competences needed for establishing successful innovative business
COMPETENCES	Develop new business plan within CE and GE (carry out idea into realization) Introduce, improve or adapt new innovative solutions in GE business

Learning Unit 5; Introduction to Circular Economy

In this unit, background, definitions, the global context threats, the ecological footprints and world bio-capacity, are explained. The need for urgent actions and the opportunities for resource efficiency and circularity are presented. Linear versus circular and value creation in circular economy are described.

LEARNING UNIT 5	**INTRODUCTION TO CIRCULAR ECONOMY**
Sub-topics	Global context and threats in today's economy Linear versus circular approach and principles of CE Resource efficiency and circularity opportunities
Workload	10 hours
Main achievement	Learner understands the global context and is able to identify green business opportunities.
LEARNING OUTCOMES	
KNOWLEDGE	Understand the global context Recognize the difference between linear economy and circular economy Get to know circular economy principles
SKILLS	Identify business opportunities within CE and GE
COMPETENCES	Respond to complex challenges, considering principles of circular economy and green entrepreneurship

Learning Unit 6; Technical and Biological Cycles

Resource efficiency is explained and how it is applied to identify and eliminate resource losses. Technical cycles and strategies to close the cycles are presented. Finally, the biological cycles are explained. Case studies and examples are provided for both.

LEARNING UNIT 6	**TECHNICAL AND BIOLOGICAL CYCLES**
Sub-topics	Resource efficiency and how to approach it Technical cycles – five strategies to close the cycles Biological cycles strategies
Workload	10 hours
Main achievement	Learner understands opportunities for resource efficiency in a business and can propose business ideas based on closing the technical and biological cycles.
LEARNING OUTCOMES	
KNOWLEDGE	Have knowledge about resource efficiency concepts and methods Understand technical materials and nutrients strategies to close the cycles
SKILLS	Ability to analyse and interpret the relevant data, feedback, results available Ability to identify, assess and propose technical improvements in material cycles of business
COMPETENCES	Propose innovative method approaches to minimize the use of resources and materials

Learning Unit 7; Circular Design

This unit aims to explain life cycle thinking and the how the design of products and services can contribute to the circular economy. Further it explains the strategies that can be applied in the design process to support the development of new and innovative products and services.

LEARNING UNIT 7	**CIRCULAR DESIGN**
Sub-topics	Life cycle thinking approach The role of design in a circular economy Circular design strategies and criteria
Workload	10 hours
Main achievement	Learner has an understanding of the role of design in the circular economy model and become familiar with circular design concepts and strategies.
LEARNING OUTCOMES	
KNOWLEDGE	Theoretical knowledge on design for circular economy concepts and principles Theoretical knowledge of the process of product and service design with circularity considerations
SKILLS	Ability to generate innovative and creative circular design solutions Relating circular design strategies and criteria to a project
COMPETENCES	Able to fully translate circular design strategies into options when designing a product or a service

Learning Unit 8; Circular Business Models

Businesses can be highly benefited from circular economy principles, as new value creation opportunities arise from sustainability considerations and new networking opportunities. In this context, this learning unit aims at supporting young entrepreneurs to understand how value can be created through the transition from linear to new circular business strategies and models.

LEARNING UNIT 8	**CIRCULAR BUSINESS MODELS**
Sub-topics	Value creation in a circular economy Business model canvas Business strategies in a circular economy
Workload	10 hours
Main achievement	Learner understands how value can be created in a circular economy and be able to select and design the circular business model and strategy that captures that value.
LEARNING OUTCOMES	
KNOWLEDGE	Understand the concepts of value creation and business models in a circular economy Get to know how to develop a circular business model
SKILLS	Identify value creation opportunities towards circularity in a business Design and develop the strategy that will make the business circular for the creation of new circular business models
COMPETENCES	Define a circular business strategy and lead an interdisciplinary team to transit towards a circular business model

4. **Methods of learning outcomes evaluation:**

- **partial mark/final note:**

Online test / presentation

5. **Methods of teaching:**

- **E learning:**

e-learning, case studies, quizzes, interactive exercises, individual work

6. Marks

Mark	0-49%	50-74%	74-90%	91-100%
Criteria	No response or very limited knowledge of the content of the training. Student does not know the basic issues discussed.	Knowledge of training content limited to the minimum necessary. Student knows the basic issues discussed and their solutions.	Satisfactory or good knowledge of the content of the training. Student knows and understands the solution to the problems.	Very good knowledge of the content of the training or beyond the program standards. Student has deep knowledge of the problems and their solutions.

7. Literature

- Basu, A., Osland, A., & Solt, M.E. 2008. A New Course on Sustainable Entrepreneurship.
- Demirel, P., Li, Q.C., Rentocchini, F. et al. 2019. Born to be green: new insights into the economics and management of green entrepreneurship. *Small Bus Econ,* 52, 759–771.
- Farreny R., Benet A., Morales L., Cerantola N., Cormenzana M., Iglesias J. & Merlo G. 2015. The Handbook for Green Entrepreneurs in the Mediterranean.
- Melay, I., & Kraus, S. 2012. Green entrepreneurship: Definitions of related concepts. Int. J. Strateg. Manag, 12, 1-12.
- Muo, I., Azeez, A. 2019. Green Entrepreneurship: Literature Review and Agenda for Future Research. *International Journal of Entrepreneurial Knowledge*, 7(2), 17-29.
- Ndubisi, N. & Nair S. 2009. Green Entrepreneurship (GE) and Green Value Added (GVA): A conceptual framework. *International Journal of Entrepreneurship*, 13, 21-34.
- OECD. 2019. Business Models for the Circular Economy: Opportunities and Challenges for Policy, OECD Publishing: Paris. https://doi.org/10.1787/g2g9dd62-en
- Trapp C., Kanbach D. 2021. Green entrepreneurship and business models: Deriving green technology business model archetypes. *Journal of Cleaner Production*, Volume 297.