

Erasmus+ project

“Multi-purpose center for adult education in clean environment – ECO-Center”

Trainees guide

Step-by-step instructions how to explore ECO-Center training model for personalized learning through online/offline delivery of educational content

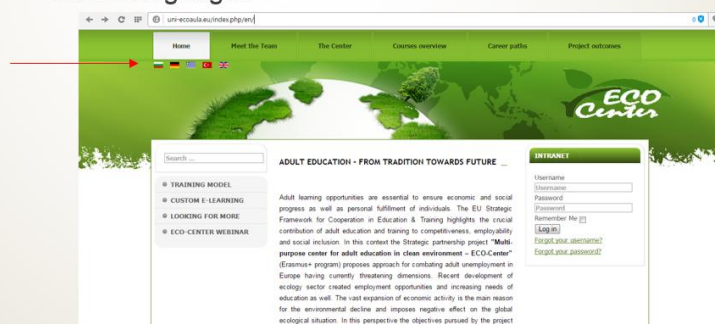
2014-1-BG01-KA204-001645



Get acquainted with ECO-Center project online ...

► HOW TO DO IT?

- Use a recent version of any common web browser with enabled JavaScript to go to: <http://uni-ecoaula.eu>
- Select a language: the information is multilingual - choose among Bulgarian, German, English, Greek and Turkish languages



2014-1-BG01-KA204-001645



Get acquainted with ECO-Center project online ...

► WHAT IS ESSENTIAL TO KNOW?

- Meet the project team



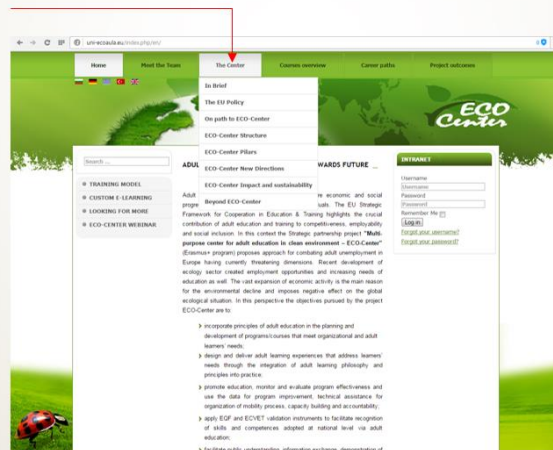
2014-1-BG01-KA204-001645



Get acquainted with ECO-Center project online ...

► WHAT IS ESSENTIAL TO KNOW?

- Get familiar with strategic multipurpose ECO-Center



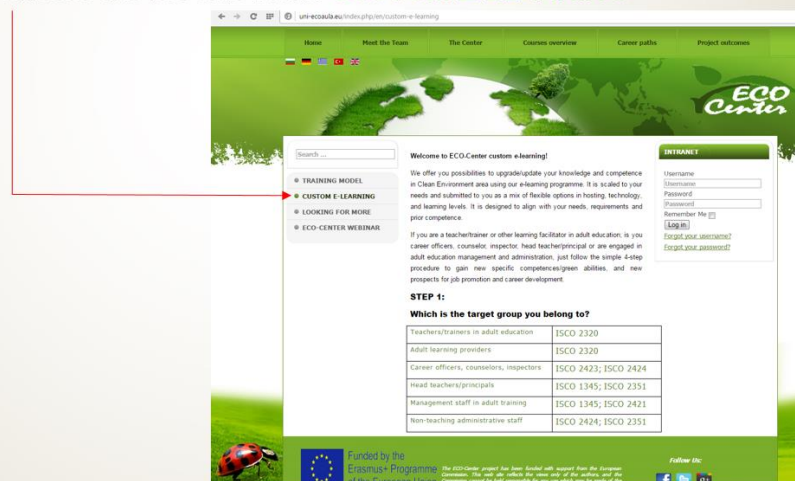
2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► HOW TO BEGIN?

- Choose the left-side menu **CUSTOM E-LEARNING**





Enjoy your training step-by-step...

► How to make a personalized choice?

► STEP 1: choose the target groups you belong to:

- Teachers/trainers in adult education ✓ ISCO 2320 ✓
- Adult learning providers ISCO 2320
- Career officers, counselors, inspectors ISCO 2423; 2424
- Head teachers/principals ISCO 1345; 2351
- Management staff in adult training ISCO 1345; 2421
- Non-teaching administrative staff ISCO 2424; 2351

... and check the corresponding ISCO at:

http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf



Enjoy your training step-by-step...

► How to make a personalized choice?

► STEP 1: choose the target groups you belong to:

STEP 1:
Which is the target group you belong to?

Teachers/trainers in adult education	ISCO 2320
Adult learning providers	ISCO 2320
Career officers, counselors, inspectors	ISCO 2423; ISCO 2424
Head teachers/principals	ISCO 1345; ISCO 2351
Management staff in adult training	ISCO 1345; ISCO 2421
Non-teaching administrative staff	ISCO 2424; ISCO 2351

2320 Vocational Education Teachers

Unit Group 2320

Vocational Education Teachers

Vocational education teachers teach or instruct vocational or occupational subjects in adult and further education institutions and to senior students in secondary schools and colleges. They prepare students for employment in specific occupations or occupational areas for which university or higher education is not normally required.

Tasks include –

- (a) developing curricula and planning course content and methods of instruction;
- (b) determining training needs of students or workers and liaising with individuals, industry and other education sectors to ensure provision of relevant education and training programmes;

- (c) presenting lectures and conducting discussions to increase students' knowledge and competence;
- (d) instructing and monitoring students in the use of tools, equipment and materials and the prevention of injury and damage;
- (e) observing and evaluating students' work to determine progress, provide feedback and make suggestions for improvement;
- (f) administering oral, written or performance tests to measure progress, evaluate training effectiveness and assess competency;
- (g) preparing reports and maintaining records such as student grades, attendance rolls and training activity details;
- (h) supervising independent or group projects, field placements, laboratory work or other training;

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- Click on your selected choice to enter **STEP 2**:
choose your professional area and EQF level among:

↓	Biology (BIO)	EQF 6	EQF 7
	Chemistry (CHEM)	EQF 6	EQF 7
	Ecology (ECO)	EQF 6	EQF 7
	Environmental engineering (ENV-ENG)	EQF 6	EQF 7
	Civil engineering (CIV-ENG)	EQF 6	EQF 7

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 2**: Choose your professional area and EQF level

STEP 2 What is your professional area and EQF level?		
Biology (BIO)	EQF 6	EQF 7
Chemistry (CHEM)	EQF 6	EQF 7
Ecology (ECO)	EQF 6	EQF 7
Environmental engineering (ENV-ENG)	EQF 6	EQF 7
Civil engineering (CIV-ENG)	EQF 6	EQF 7

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- Click on your selected choice to enter **STEP 3**: your specific competences/green abilities & soft skills:

url=ec.europa.eu/images/Tables/EFQ_Custom/Biology_EFQ.pdf

EQF Level*	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as <i>theoretical and/or factual</i> .	In the context of EQF, skills are described as <i>cognitive</i> (involving the use of logical, intuitive and creative thinking), and <i>practical</i> (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is described in terms of <i>responsibility and autonomy</i> .
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialized field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups

* Descriptors defining levels in the European Qualification Framework (EQF) (<https://ec.europa.eu/ploteus/content/descriptors-page>)

STEP 3

Your specific competences/green abilities and soft skills are [here](#)

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 3**: your specific competences/green abilities & soft skills:

Specific competences/green abilities for teachers/trainers in adult education; area Biology

Area:	Biology
EQF/NQF:	6
Subject specific competences/green abilities	
The professionals study living organisms and their interactions with each other and with the environment, and apply this knowledge to solve human health and environmental problems. They work in diverse fields such as botany, zoology, ecology, marine biology, genetics, immunology, pharmacology, toxicology, physiology, bacteriology and virology.	
Competences include abilities/skills to:	
<ul style="list-style-type: none"> - advice the government, organizations and businesses on conservation and management of natural resources, the effects of climate change and pollution, etc. - design and carry out environmental impact assessments to identify changes caused by natural or human factors - design and conduct experiments and analyses - elaborate plans for management of renewable resources - examine living organisms using a variety of specialised equipment, instruments, technologies and techniques - explore areas affected by ecological problems and to identify causes or determine solutions - gather specimens and data from living organisms and study their origin, development, chemical and physical form, structure, composition, and life and reproductive processes - identify, classify, record and monitor living organisms and to maintain databases - measure physical parameters of different environments to determine their relationship to their habitats 	

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- Click on your last **STEP 4** to follow your training path and gain the selected specific competences/green abilities & soft skills:

EQF Level*	Knowledge	Skills	Competence
	In the context of EQF, knowledge is described as <i>theoretical and/or factual</i> .	In the context of EQF, skills are described as <i>cognitive</i> (involving the use of logical, intuitive and creative thinking), and <i>practical</i> (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is described in terms of <i>responsibility and autonomy</i> .
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialized field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups

* Descriptors defining levels in the European Qualification Framework (EQF) (<https://ec.europa.eu/ploteus/content/descriptors-page>)

STEP 3
Your specific competences/green abilities and soft skills are [here](#)

STEP 4
[Follow your training path to gain them!](#) ←

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 4** - your training path can be followed from the informative table that offers you:
 - Synopsis on your choice for STEPS 1 to 3
 - Training path composition: the Unit of Learning Outcomes
 - The Credits this Training Path provides
 - Access to the knowledge content
 - Self-evaluation TEST
 - Options for downloading & printing

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 4** - your training path
- The knowledge content:
 - Is structured in hierarchical order up to 3-digit subtitles (e.g. 1., 1.1., 1.1.1)
 - Is freely browsable among the main titles/subtitles through the „previous“/„next“ arrows or the submenu at the upper part of the main screen
 - Each LO in the Unit of learning Outcomes is independently accessible
 - Can be (self)evaluated

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 4** - your training path can be followed from the informative table:

uni-ecoaula.eu/images/Tables/BIO-6.pdf

BIO-6.pdf 1 / 1

Training Path:	Occupation	EQF Ref. level	Credits	Unit of Learning Outcomes
BIO-6	Teacher / Trainer in Biology	6	7	3 (LO 1, LO 3, LO 11)
Learning Outcomes – knowledge content				Credits
LO 1: Introduction to remediation technology				2
LO 3: GMMs in food production and safety				3
LO 11: Plants as vehicles for cross-infective pathogens transmission				2
TEST				Total: 7

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- STEP 4 - your training path
- The knowledge content:



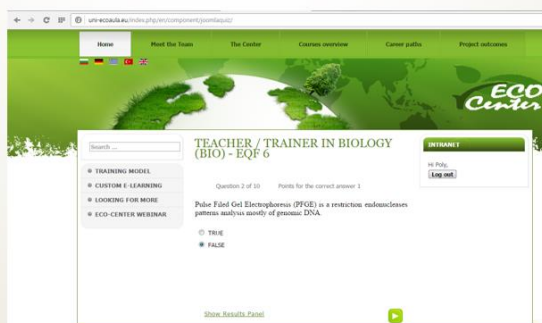
2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- STEP 4 - your training path: checking and evaluation of the knowledge learned
 - The self-evaluation starts through „TEST“ link at the end of the Training path
 - A set of 10 questions: Multiple Choice Questions (MCQ) and True/False Questions (TFQ) is generated



2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

► STEP 4 - your training path: checking and evaluation of the knowledge learned

► The evaluation procedure – 6 consequent steps:

- Click on “TEST” link
- Start answering the randomly chosen 10 questions from the question pool
- After answering the questions, click on the “Next” button
- Explore the ‘Quiz results’ summary checking your score by categories, the passing score threshold, and the elapsed time
- Check the ‘Quiz message’; if necessary – take the quiz again; maximum 3 attempts are aloud
- See the review of your test results



2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

► STEP 4 - your training path: checking and evaluation of the knowledge learned

- Points for the correct answer: 1
- The advancement and achievement of the test can be followed in the ‘Show results’ panel



2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 4** - your training path: checking and evaluation of the knowledge learned
 - 'Quiz message' announced the test final result: 'passed' or 'failed'
 - An option 'take this quiz again' generates another set of 10 subject questions; maximum 3 attempts are allowed

Search ...

- TRAINING MODEL
- CUSTOM E-LEARNING
- LOOKING FOR MORE
- ECO-CENTER WEBINAR

TEACHER / TRAINER IN BIOLOGY (BIO) - EQF 6

Quiz Results

Your score: 1.00 out of 10.00 (10.00%)

Score by categories:

- LO1: 0 out of 3 (0%)
- LO2: 1 out of 4 (25%)
- LO3: 0 out of 3 (0%)

Passing score: 6.00 (60.00%)

Elapsed time: 05:37

Quiz Message

You didn't pass the quiz.

[Review](#) [Take this quiz again](#)

2014-1-BG01-KA204-001645



Enjoy your training step-by-step...

► How to make a personalized choice?

- **STEP 4** - your training path: checking and evaluation of the knowledge learned
 - 'Review' panel track question by question the true/false answers and your personal score

Home Meet the Team The Center Courses overview Center profile Project activities

Search ...

- TRAINING MODEL
- CUSTOM E-LEARNING
- LOOKING FOR MORE
- ECO-CENTER WEBINAR

TEACHER / TRAINER IN BIOLOGY (BIO) - EQF 6

Question 1 of 10 Points for the correct answer 1 - 1

Enterococci are also important pathogens responsible for serious infections, especially in healthy persons.

TRUE 100%

FALSE 0%

This question was answered 1 times.

Your answer
TRUE

[Review](#) [Take this quiz again](#)

Funded by the
Erasmus+ Programme
of the European Union

Follow Us

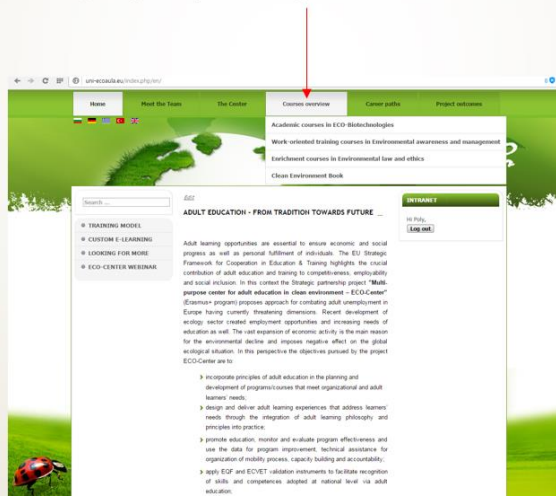
2014-1-BG01-KA204-001645



... and benefit also from:

► Courses overview

- Three type of training courses oriented to project target groups designed for EQF levels 5, 6, and 7



2014-1-BG01-KA204-001645



... and benefit also from:

► Courses overview

- Each courses is offered as a blend of concise summary, full-text pdf, and as ppt



2014-1-BG01-KA204-001645



... and benefit also from:

► Courses overview

- Each courses is offered as a blend of concise summary, full-text pdf, and as ppt

LO 1: INTRODUCTION TO REMEDIATION TECHNOLOGY

The Learning Outcome (LO) 1: Introduction to remediation technology provides basic information about pollutants as substances contaminating natural environments. It discusses the process of pollution - its occurrence when the natural environment cannot eliminate the negative effects of the hazardous substances. Human activities as major factors linked to environmental pollution and global warming, and remediation of the polluted environment and leading to free from hazardous contaminants as essential issues in maintaining ecological balance are revealed. The need of human intervention for fast remediation of polluted environments and the application of diversity of remedial procedures depending on the nature and level of contamination are also discussed. Data about the utilization of conventional and modern techniques for remediation of polluted environments are given. The sustainability of remediation technologies as an extremely important element for assurance of the long-term remediation effect and avoiding potential problems in future is stressed upon. Finally, the use of certain genetically modified organisms for bioremediation purposes is commented.

LO 2: BIOREMEDIATION OF HAZARDOUS POLLUTANTS

The Learning Outcome (LO) 2: Bioremediation of hazardous pollutants is focused on the main today's environmental problems in the context of their direct link to the development of human civilization and the significant increase in environmental pollution that have started with industrial revolution in the 19th century. The learning material discusses the increased consumption of carbon-based energy sources, extraction and processing of mines, and uncontrolled release of contaminants that created the nowadays environmental pollution crisis. Information about the contaminants created by human activities that present major risks to environment and human health is provided. The possibilities to utilize plants and microorganisms to remediate polluted sites are discussed. Bioremediation as an environment friendly procedure that can be utilized to remediate the contaminated sites is described. Various bioremediation techniques that have been developed to clean up sites polluted with hazardous contaminants are commented. Information about plants and microorganisms that can remediate polluted sites by converting toxic compounds into nontoxic forms is given. The decrease in the pollution and release of pollutants to environment as an approach to control the environmental pollution is also discussed. The application of bioremediation combinations with conventional techniques to ameliorate the effects of environmental pollution is commented as well.

BASIC DATA ABOUT THE COURSE

Course Title: Advances in Bioremediation
Course authors: Feriye Çelik Tokrak, Tüzin Kar, Ali Ramazan Alan, İsmet Kar, Selçuk Tokrak
Course Type:

Academic	Enrichment	Work-oriented training
✓		✓

Target Group: Teachers/trainers in adult education; career officers, consultants, inspectors, head teachers / principals
EQF level:

EQF level 5	EQF level 6	EQF level 7
✓		✓

Course aims to provide general information about remediation technology and diversity of remedial procedures applied for polluted environments with special emphasis on bioremediation of hazardous pollutants.
Knowledge background: basic knowledge in plant physiology, microbiology, ecology
Course content:
Learning Outcome 1: Introduction to remediation technology
1. Introduction to remediation technology
1.1 Terms in remediation
1.2 Causes of remediation
2. Hazardous environmental contaminants
2.1 Liquid fuel (petroleum, natural gas and coal)
2.2 Industrial waste
2.3 Municipal waste (solid waste and sewage)
2.4 Agricultural waste
2.5 Pesticides
2.6 Heavy and toxic metals
3. Characterization of a contaminated site
4. Bioremediation
4.1 Criteria for bioremediation strategies
4.2 Bioremediation Technologies
5. References
Learning Outcome 2: Bioremediation of hazardous pollutants
1. Bioremediation of hazardous pollutants
1.1 Bioremediation of ecosystems contaminated with heavy metals
1.2 Bioremediation of ecosystems contaminated with organic pollutants
2. Future prospects
3. Conclusions
4. References

2014-1-BG01-KA204-001645



... and benefit also from:

► Courses overview

- Each courses is offered as a blend of concise summary, full-text pdf, and as ppt

ECO-BIOTECHNOLOGIES

ACADEMIC COURSE ADVANCES IN BIOREMEDIATION

PAMUKKALE UNIVERSITY
Assoc. Prof. Dr. FERIYE ÇELİK TOKRAK
Assoc. Prof. Dr. İSMEH KAR
Assoc. Prof. Dr. ALİ RAMAZAN ALAN
Assoc. Prof. Dr. İSMEH KAR
Prof. Dr. SELÇUK TOKRAK

LO 1: INTRODUCTION TO REMEDIATION TECHNOLOGY

1. Introduction to remediation technology

Our environment is contaminated by chemical compounds harmful to all biological systems. Uncontrolled industrial development, population growth, urbanization, higher demand for food, abandonment of agricultural lands and release of hazardous chemicals are the major contributors of today's environmental pollution problems. There is an environmental need for environment friendly practices and a growing demand for restoration of contaminated sites.

1.1. Terms in Remediation

Pollution is the discharge of a toxic or contaminating substance that is likely to have an adverse effect on the natural environment or life. **Contamination** makes a place or a substance (such as water, air, or food) no longer suitable for use. **Remediation** restores contaminated site to return them to their natural state. **Environmental remediation** is the removal of pollution or contaminants from soil, water (both ground water and surface water) and air. These waste products are removed for the protection of human health, as well as to restore the environment. These cleaned up sites can also be used for urban development. Environmental remediation is highly regulated and subject to a range of legal requirements, which are generally based on assessments of human health and environmental risks. Remediation projects can range from large, expensive projects, in which a great deal of effort is spent to clean up contaminated sites, to smaller, less costly projects, such as cleaning up a highway accident or a leak of spilled. Remediation projects usually begin with a site assessment to determine the costs of the project, as well as the technology that would be the most appropriate for the particular site. Environmental remediation is carried out on various environmental media, including soil (topsoil, subsoil and sediments), water (groundwater and surface water) and air. **Soil contamination** can result from chemical spills, industrial activity, and the use of fertilizers and pesticides. Soil contamination is caused by many of the same factors that cause groundwater contamination. **Water contamination** may be the result of industrial practices (leaking or drilling for natural gas and oil) and release of pollutants directly into the water or by runoff from the ground. **Air contamination** is caused by any substance that people inhale (greenhouse gases such as carbon dioxide (CO₂), methane, sulfur dioxide (SO₂) and chlorofluorocarbons) or natural causes (forest fires, volcanic eruptions, wind erosion, pollen dispersal, evaporation of organic compounds, and natural radioactivity) into the atmosphere.

2014-1-BG01-KA204-001645



... and benefit also from:

► Courses overview

- Each courses is offered as a blend of concise summary, full-text pdf, and as ppt

THE TRAINING DETAILS

Teachers/trainers in adult education: adult learning providers	Biology, Chemistry, Ecology, Environmental engineering, Civil engineering, Science education
EQF Reference level	6/7/7
Training and learning methods	Online (www.erasmus.org), Offline (CD), text
Trainee assessment	Online tests; Paper based tests
LOs	LO1: Introduction to remediation technology LO2: Bioremediation of hazardous pollutants
Weighting of assessment: ECVEET Credits	LO1 – 2 ECVEET Credits gained and proved by certificate LO2 – 3 ECVEET Credits gained and proved by certificate

ERASMUS+ PROGRAMME
KEY ACTION 2: COOPERATION FOR INNOVATION AND THE EXCHANGE OF GOOD PRACTICES
STRATEGIC PARTNERSHIPS IN THE FIELD OF EDUCATION, TRAINING AND YOUTH
Multi-purpose center for adult education in clean environment
ECO-Center
**ACADEMIC COURSE
ADVANCES IN BIOREMEDIATION**

2014-1-BG01-KA204-001645



... and benefit also from:

► Career paths

- ECO-Center Competences Catalogue:
 - A set of competences description for adult training providers in clean environment
 - The competences are described in accordance with EQF levels 5, 6 and 7, and main descriptors knowledge, skills, abilities and individual attributes
 - The competences outline the general as well specific cognitive and technical abilities you can re-build and re-skilled through the various types of courses offered

2014-1-BG01-KA204-001645



... and benefit also from:

► Career paths

► ECO-Center Competences Catalogue:

- Click on Competences Catalogue submenu of the menu Career paths; follow the link [ECO Center Competences Catalogue](#)
- Choose professional area and EQF level
- Learn about the relevant subject specific competences / green abilities



2014-1-BG01-KA204-001645



... and benefit also from:

► Career paths

► ECO-Center Competences Catalogue:

Professional areas specific competences/green abilities			
Teachers/trainers in adult education	Adult learning providers	Career officers, counselors, inspectors, head teachers / principals	Education managers, other management staff in adult training institutions; non-teaching administrative staff
<ul style="list-style-type: none"> o Biology <ul style="list-style-type: none"> o EQF 6 o EQF 7 o Chemistry <ul style="list-style-type: none"> o EQF 6 o EQF 7 o Ecology <ul style="list-style-type: none"> o EQF 6 o EQF 7 o Environmental engineering <ul style="list-style-type: none"> o EQF 6 o EQF 7 o Civil engineering <ul style="list-style-type: none"> o EQF 6 o EQF 7 	<ul style="list-style-type: none"> o Science education <ul style="list-style-type: none"> o EQF 6 o EQF 7 	<ul style="list-style-type: none"> o Environmental ethics <ul style="list-style-type: none"> o EQF 6 o EQF 8 o Public health <ul style="list-style-type: none"> o EQF 5 o EQF 6 o Legislation <ul style="list-style-type: none"> o EQF 6 o EQF 8 	<ul style="list-style-type: none"> o Management <ul style="list-style-type: none"> o EQF 5 o EQF 6 o Public relations <ul style="list-style-type: none"> o EQF 5 o EQF 6 o Economics <ul style="list-style-type: none"> o EQF 6 o EQF 8

Specific competences/green abilities for teachers/trainers in adult education; area Biology

Area:	Biology
EQF/NCF:	6
Subject specific competences/green abilities	
<p>The professionals study living organisms and their interactions with each other and with the environment, and apply this knowledge to solve human health and environmental problems. They work in diverse fields such as botany, zoology, ecology, marine biology, genetics, immunology, pharmacology, toxicology, physiology, bacteriology and virology.</p> <p>Competences include abilities/skills to:</p> <ul style="list-style-type: none"> - advise the government, organizations and businesses on conservation and management of natural resources, the effects of climate change and pollution, etc. - design and carry out environmental impact assessments to identify changes caused by natural or human factors - design and conduct experiments and analyses - elaborate plans for management of renewable resources - examine living organisms using a variety of specialised equipment, instruments, technologies and techniques - explore areas affected by ecological problems and to identify causes or determine solutions - gather specimens and data from living organisms and study their origin, development, chemical and physical form, structure, composition, and life and reproductive processes - identify, classify, record and monitor living organisms and to maintain databases - measure physical parameters of different environments to determine their relationship to their habitats 	

2014-1-BG01-KA204-001645

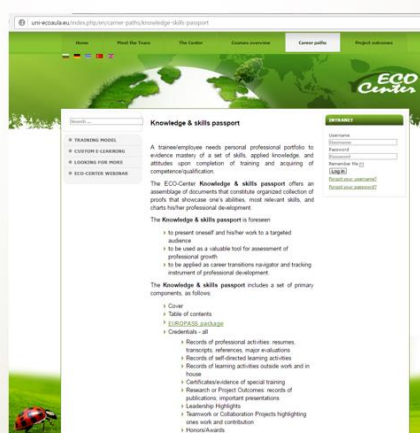


... and benefit also from:

► Career paths

► Knowledge & skills passport:

- Use the guidelines how to assemble your personal professional portfolio to evidence mastery of skills, applied knowledge, and attitudes



2014-1-BG01-KA204-001645



... and now

► Welcome to ECO-Center custom e-learning!

- We offer you possibilities to upgrade/update your knowledge and competence in Clean Environment area using our e-learning programme
- It is scaled to your needs and submitted to you as a mix of flexible options in hosting, technology, and learning levels
- It is designed to align with your needs, requirements and prior competence

ECO-Center Team

This project has been funded with support from the European Commission. This material reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.