

## TRAINER'S HANDBOOK

<i>Project title:</i>	Urban Greening Systems for the Mediterranean Region
<i>Project acronym:</i>	UGreenS
<i>Project number:</i>	2013-1-CY1-LE005-03079
<i>Agreement Number:</i>	LLP-LdV-ToI-13-CY-1671307
<i>Project instrument:</i>	Leonardo da Vinci (Transfer of Innovation)
<i>Document type:</i>	Deliverable
<i>Nature of document:</i>	Report
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<i>Pertinent Work package:</i>	WP2

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# UGreenS Trainer's Handbook

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## 1 Introduction

The UGreenS project is undertaken within the context of the European Commission co-funded Leonardo da Vinci - Transfer of Innovation programme. Its aim is to promote awareness and knowledge regarding the implementation of urban greening technologies (leading to more sustainable construction practices) in Mediterranean countries, primarily through transfer of knowledge via training sessions. This handbook provides an overview of the training sessions, presenting the content, feedback forms, supplementary material and online learning platforms that can be used for the purposes of training, as well as “to-do” checklists concerning organisation and facilitation of training events.

This handbook can be of use to anyone involved in an event either by delivering the training or in an organisational/administrative role. It’s helpful to use in preparation of training, as it contains a rundown of all the major steps that have to be taken in order to prepare the training session, from registrations and venue and catering booking to provision of educational material, and all the way to collection of feedback and establishment of post-course support and contact.

Also included are basic instructions to create courses and enrol users with the Moodle online learning platform (E-learning Environment), to use either as a supplement to or a substitute of traditional face-to-face training sessions.

## 2 Modules

To better facilitate training and ensure completion of its goals, the project’s curriculum has been organized in two thematically consistent modules, each of which has been further broken down into a number of units dependent on the Training’s needs. It should be noted that both the organisational structure and the exact content of the courses should not be considered set in stone and thus become restrictive and unwieldy; in fact Trainers are encouraged to tailor the materials forms and content to the perceived specific needs of their audience/trainees to the extent that this is possible, always of course in conjunction with the Project’s Coordinator to ensure that the core of the project’s curriculum remains intact and can thus be accurately transferred to the trainees.

An overview of the specific modules’ content and learning objectives follows:

### 2.1 Module 1: Green Roofs Technologies

#### 2.1.1 Module Summary

A green roof system is an extension of the existing roof which involves a high quality water proofing and root repellent system, a drainage system, filter cloth, a lightweight growing medium and plants. The benefits ensuing from green roofs are many and include the mitigation of the heat island effect, flash-flood mitigation, energy savings in buildings, aesthetic enhancement of the urban environment, and the increase in urban biodiversity.

This module helps participants receive in-class and hands-on training to the various aspects of implementing any of the three types of green roofs (i.e. extensive, semi-intensive, and intensive). It introduces technical information on the structure and layers of green roofs, structural considerations from the perspective of the building's static ability, on appropriate selection of plants, irrigation and fertigation needs, as well as costing and implementation of existing guidelines (as these have been modified to suit the needs of Mediterranean countries).

### 2.1.2 Key topics

- Introduction to urban greening concepts and its principles
- Importance of urban greening
- Green roofs as urban greening technology
- Advantages of green roofs as urban green spaces
  - Environmental
  - Social
  - Economical
- Hurdles of green roof materialization in Mediterranean region
  - Public perception
  - Building loading
  - Governmental, state and countries incentives
- Professions and expertise involved in green roofing
- Legal status of green roofs among Mediterranean partner countries
- Green roof status among Mediterranean countries
  - Acreage
  - Typology
  - Spreading pattern
  - Economic aspects
- Green roof typology
  - Singled and multi-layered green roof systems
  - Extensive, semi-intensive, intensive and adaptive
- Existing guidelines for green roofing
  - Presentation of the major and most significant aspects of existing guidelines
  - Deviations from guidelines in the Mediterranean region
- Typical layering of green roof systems
  - Water impermeable layer
    - Material types
    - Construction
  - Thermal insulation
    - Material types
    - Construction
  - Vapor barrier
  - Protection layer
  - Drainage layer
  - Geotextile
    - Geotextile types
    - Selection criteria
- Substrate layer
  - Material selection
  - Material capacities
  - Mixing procedures
  - Technical analysis and performances of substrate mixes
- Plant selection
  - Climatic zones

- Plant characteristics
- Tree anchorage
  - Methods
  - Efficacy
- Automated irrigation systems
  - Sub-irrigation
  - Drip sub-surface irrigation
  - Drip surface irrigation
  - Sprinkler irrigation
  - Alarm systems
- Utilization of recycled water on green roof systems
  - Water analyses
  - Protection of green roof systems
  - Plant tolerance

### 2.1.3 Learning outcomes for the Green Roofs Module

- Determine major functions and components of a green roof;
- Describe characteristics and assess various advantages of different green roof systems;
- Utilize an integrated design process in your project for maximum benefit;
- Evaluate the major market drivers encouraging the green roof industry;
- Understand the principles of plant physiology and soil sciences as they apply to green roofs;
- Identify appropriate applications of various plant and growing media types for your green roof project;
- Understand the unique technical requirements for growing media and vegetation on green roofs;
- Understand the potential implementation issues related to plant care and growing media contamination.
- Evaluate international green roof and wall guidelines, specifications and standards
- Explain the key design considerations for green roofs and walls, including the development and use of specifications;
- Analyse substrate properties relating to green roof specification and how these affect plant performance and plant selection
- Assess and analyse experimentally how green roof substrates influence stormwater runoff retention capacity
- Assess and analyse experimentally how green wall design influences thermal performance
- Compare and evaluate methods for plant selection on green roofs and walls using research and case studies;
- Discuss maintenance and management issues relevant to green roof and wall case studies
- Identify building code/municipal permit issues;
- Understand design and implementation issues for new and retrofit buildings (including structural loading concerns, drainage, erosion control, stormwater retention, etc.)

## 2.2 Module 2: Living Walls Technologies

### 2.2.1 Module Summary

Vertical greening systems are also known as green walls, bio walls or vertical gardens, and are based on the spreading of vegetation across the wall surface by using vertical structures, which may or not be fixed to an indoor wall or to a building façade. There are numerous green wall typologies which go from the simplest shape to the most sophisticated and high-tech layout. On the basis on the support structures used and the different plants selected, these systems may be split into two mayor groups: green facades and living walls.

This module helps participants receive in-class and hands-on training to the various aspects of implementing various types of living walls and vertical gardens. It introduces technical information on the structure and layers of living walls, support systems, appropriate selection of plants, irrigation, fertigation and lighting needs, architectural integration, as well as costing maintenance issues.

### 2.2.2 Key topics

- Urban greening initiatives
- Living Walls definition
- Benefits of Living Walls
- Origin and Systems evolution
- Situation in Mediterranean countries
- Comparative analysis of LW systems
- Project design and systems selection
- Landscaping & Botanical design. Species selection criteria
- Irrigation and efficient water management
- Lightning systems, light requirements
- Control and maintenance: Auxiliary engineering, information systems, sensors, SCADA, maintenance operations, fertigation, disease and plague control
- Architectural integration, attachment methods, structure design
- LW Planning and execution
- Marketing and commercial planning

### 2.2.3 Learning outcomes for the Living Walls Module

- Determine major functions and components of a living wall;
- Describe characteristics and assess various advantages of different LW systems;
- Utilize an integrated design process in your project for maximum benefit;
- Evaluate the major market drivers encouraging the LW and vertical gardens industry;
- Identify appropriate applications of various plant and growing media types for an LW project;
- Understand the unique technical requirements for growing media and vegetation on LWs;
- Explain the key design considerations for living walls;
- Discuss maintenance and management issues relevant to living walls case studies
- Understand design and implementation issues for LW projects, including marketing and commercial planning;

### 3 Training Material

The Training Material can be divided into two distinct categories:

#### 3.1 Core Training Material: Presentations covering the curriculum

These are the original presentations utilised in the face-to-face Train-the-Trainer sessions, translated and/or adequately modified to meet the needs of disparate audiences, such as the project has already reached out to and hopes to further reach out in the future.

Translation is carried out by each partner, to better suit the needs of both the target audience of each session, and correctly address the particularities of local legislation, conditions, construction industry, climate and a number of other factors that can have an effect on how the project's "lesson's" can best be used in the respective countries' environment.

To the same effect, the material included in the presentations can also be changed to some extent, when such change is beneficial to the audience's education and the achievement of the project's goals. Examples would include substituting statistics, legal premise, or climatic data in the original presentations, with data pertinent to the countries where the target audience conducts business and work.

*An important point to note in this context is that, while tailoring of the material is indeed encouraged, it should be done in a way that does not "dilute" the knowledge during its transfer. To this end, Trainers are required to closely work with the Project's Coordinator when implementing changes to the curriculum of the project, in order to ensure an adequate degree of fidelity to the original core material, which is a main deliverable of the project. Any changes should be brought to the Project Coordinator's attention and sufficient clarification for the reasoning behind the changes provided.*

#### 3.2 Supplementary Training Material: All other material pertinent to the modules and units utilised by the Trainer(s) to support the core material

This material can be of manifold nature:

- i. Practice guides,
- ii. Action plans,
- iii. Official methodologies,
- iv. Papers,
- v. Reports etc.

The source of this material can be equally disparate: official governmental authorities, professional bodies, scientific journals, independent commissions etc.

The only unifying factor is their pertinence to the material of each module and their ability to shed light on the background, current tendencies, and future projections on the state of the industry and where sustainability fits into the different aspects of urban greening in sustainable construction.

They can also be legislation documents that clarify individual states' outlook on sustainability, currently and in the future.

*Inclusion of these documents in the material provided in each training session/series of sessions is left to the judgement of the Trainers, and doesn't necessarily require any "approval" from the Project Coordinator. For the purposes of record-keeping and maintaining a general overview of the complete picture, Trainers are kindly asked to keep the Coordinator and the rest of the partners apprised on*

*the use of such material, which could be useful to and appropriate for other partners from different countries when it comes to supporting their own sessions.*

## **4 Forms**

A number of forms associated with feedback from the training sessions have been created. The goals aided by the completion and submission of those forms are as follows:

- Facilitate meticulous record-keeping,
- Maintain overview of the effectiveness of the delivery of the training,
- Gain an understanding of which modules are easier and which harder to communicate, and thus adjust accordingly,
- Provide evidence that the “Transfer of Knowledge” lying at the core of the project’s ambitions and aims is achieved.

With these goals in mind, the forms were initially created and are continuously reviewed and updated, to ensure they serve the goals that were set at the beginning, and do not in fact become a hindrance over the course of the project.

*While the completion of such a multitude of forms during training events where resources are usually needed elsewhere as well, might seem overly bureaucratic and unnecessary, if not downright time-consuming and excessive, experience has shown that timely completion of the forms provides an excellent benchmark against which to measure the project’s effectiveness in achieving its goals and thus plan the future accordingly, as well as saves a lot of time later on when data collation deadlines approach as a detailed overview of all training undertaken is readily available in an accessible and usable format.*

### **4.1 Breakdown of forms**

A list of the forms which are used for the collection of feedback from the training events follows, with a brief explanation for each entry.

#### **4.1.1 Pre-Course Questionnaire (included in QM Plan)**

The form details the key points/learning objectives for each module, asking the trainee to estimate their current (prior to the event) knowledge and familiarity with each of the subjects.

The digital version of the form also includes fields detailing the participant’s vocational group, sector, educational level and other details required for the completion of project’s report forms.

#### **4.1.2 Post-Course Questionnaire (included in QM Plan)**

The form again re-visits the key points /learning objectives for each module, asking the trainee to estimate their level of knowledge on the subjects after completion of the training.

Also included are questions regarding the organisational aspect of the event and the effectiveness of the trainers and training material utilised.

#### **4.1.3 Sign-In Sheet**

Used to collect the following data from the individuals receiving training in every event:

- Name

- Signature
- Vocational Group
- Educational Field
- Educational Level
- Economic Sector

The digital version of the form contains drop-down menus from which the participants (or the project partner organising the data) can choose. The options correspond to those in the digital version of the Pre-Course Questionnaire.

#### **4.1.4 Daily Evaluation Form (included in QM Plan)**

This form is only applicable to sessions lasting for more than one day. It contains a number of free-text questions aiming to estimate which parts of the session were more enjoyable to the trainees, and which parts of the curriculum were better received/understood.

#### **4.1.5 Trainer De-Brief Form (included in QM Plan)**

This form is to be completed by the people delivering the training. The main aim is to capture the trainers' perception of which parts of the session functioned effectively and which didn't.

#### **4.1.6 Trainer Self-Assessment Questionnaire (included in QM Plan)**

This form is completed by the "trainers-in-training" and therefore is only applicable to Train-the-Trainer events. The questions ask the prospective trainers to evaluate their level of preparedness to deliver training and offer suggestions as to how to improve the training they received and intend to deliver.

#### **4.1.7 Training Report**

This is a report which presents the feedback obtained from the various Questionnaires is input and collated, for easier reference and automatic production of graphs and tables. This document in the standardised, for the scope of the project, event report format which essentially collects the most important points of the feedback into an easily accessible and presentable form, ideal for both internal circulation within the consortium and external evaluation by the NA and third parties.

## **5 Online Material Guide - Moodle**

The Moodle open-source learning platform provides a handy and practical framework to set up online learning courses, training sessions, material libraries etc. The e-learning site for the Project is maintained in Frederick University's E-learning platform. Guest access is given to instructors and students alike.

The Project's Moodle allows registered students/trainees and guests with access privileges to view and access Lecture Slides, Reading Materials, selected Educational Videos, participate in the Forums maintained courses, take Quizzes and Exams, and in essence complete any of our courses in a Distance Learning Environment.

The project's e-learning website can be accessed at <http://e-learning.frederick.ac.cy/>.

For access to the E-learning site of the course, follow these steps:

1. Visit the following URL: <http://e-learning.frederick.ac.cy>
2. Login, using the following Username: **yiota** and Password: **jhd74jh**
3. Go to Course Category entitled "*Intensive Courses*"
4. Select "*UGreenS - Urban Greening Systems in the Mediterranean*"
5. When prompted, register to the course (one-time-thing) using Password: **UGreenS**

Trainers are urged to utilise the platform to the extent they feel confident with it, as it allows the enhancement of the training delivered at standard sessions with added activities, exercises, examples and an always accessible depository of material used at and pertinent to the training sessions.

The following is a very quick run-through of the basic functions of the platform and of how they have been utilised so far within the context of the project.

Extensive documentation can be located at [http://docs.moodle.org/26/en/Main\\_page](http://docs.moodle.org/26/en/Main_page) and a wealth of instructional and demonstrative videos at <https://www.youtube.com/user/moodlehq>.

## 5.1 Course creation

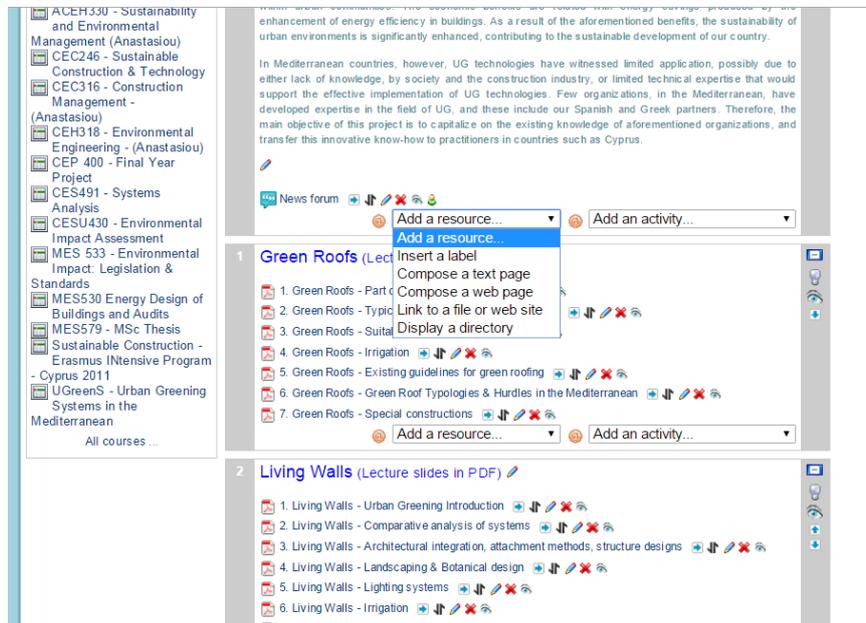
The first step to take is to create the desired course categories. This requires the trainer to have been set up with administrator rights. To manage the course categories, navigate from the Home Page to Courses, from the Navigation box on the left column of the page. From the Administration box on the left column of the page click “Turn editing on” and click “Manage Categories” on the top right of the page. From this screen the user can organise the course categories according to their preferences. The format used in the project so far is “module-based” (see Figure 1).

The screenshot displays the Moodle course management interface. On the left, a sidebar titled "My courses" lists various courses, including "ACEH330 - Sustainability and Environmental Management (Anastasiou)", "CEC246 - Sustainable Construction & Technology", "CEH318 - Environmental Engineering - (Anastasiou)", "CEP 400 - Final Year Project", "CES491 - Systems Analysis", "Construction Management (Nicolaidis / Anastasiou)", "MEM502 - Engineering Economics (MENICOU)", "MES 505 - Energy Design of Buildings", "MES 533 - Environmental Impact Legislation & Standards", "MES530 Energy Design of Buildings and Audits", and "UGreenS - Urban Greening Systems in the Mediterranean". Below the list is a link for "All courses ...".

The main content area shows a detailed view of two course categories. The first category is "Green Roofs (Lecture slides in PDF)", which includes seven sub-topics: 1. Green Roofs - Part of the Urban Green, 2. Green Roofs - Typical Layering of green roof systems, 3. Green Roofs - Suitable Plant Species, 4. Green Roofs - Irrigation, 5. Green Roofs - Existing guidelines for green roofing, 6. Green Roofs - Green Roof Typologies & Hurdles in the Mediterranean, and 7. Green Roofs - Special constructions. The second category is "Living Walls (Lecture slides in PDF)", which includes nine sub-topics: 1. Living Walls - Urban Greening Introduction, 2. Living Walls - Comparative analysis of systems, 3. Living Walls - Architectural integration, attachment methods, structure designs, 4. Living Walls - Landscaping & Botanical design, 5. Living Walls - Lighting systems, 6. Living Walls - Irrigation, 7. Living Walls - Control and maintenance, 8. Living Walls - Project design, planning and execution, and 9. Living Walls - Case studies.

Figure 1: Course breakdown in the course management screen

Having set-up the categories, the trainer can proceed to populate them with courses. To create a course, navigate from the Home Page to Courses, from the Navigation box on the left column of the page. From the Administration box on the left column of the page click “Turn editing on” and go to the bottom of the page to “Add new section”. In this screen the user can specify the details of the course; so far for the purposes of the project, the topic-based course format has been used almost exclusively. You are prompted to select the number of topics for the course, if you opt for this option, as seen in Figure 2.



**Figure 2: Creating new resource - selecting format**

After setting up the course, the trainer can then proceed to upload material and/or activities. From the Courses screen, select the course you wish to embellish (note the “editing” must be turned “on” for all of these actions to be available), and click “Add an activity or resource”. You will be prompted to specify which element you’d like to add. In Figure 3 a sample course with two topics populated with files is displayed.

The screenshot shows a course resources page for 'FUC > UGreenS > Resources'. It contains a table with two topics and their respective resources. The table has columns for 'Topic', 'Name', and 'Summary'.

Topic	Name	Summary
1	1. Green Roofs - Part of the Urban Green	
	2. Green Roofs - Typical Layering of green roof systems	
	3. Green Roofs - Suitable Plant Species	
	4. Green Roofs - Irrigation	
	5. Green Roofs - Existing guidelines for green roofing	
	6. Green Roofs - Green Roof Typologies & Hurdles in the Mediterranean	
	7. Green Roofs - Special constructions	
2	1. Living Walls - Urban Greening Introduction	
	2. Living Walls - Comparative analysis of systems	
	3. Living Walls - Architectural integration, attachment methods, structure designs	
	4. Living Walls - Landscaping & Botanical design	
	5. Living Walls - Lighting systems	
	6. Living Walls - Irrigation	
	7. Living Walls - Control and maintenance	
	8. Living Walls - Project design, planning and execution	
	9. Living Walls - Case studies	

At the bottom of the page, there is a footer with a logo and text: 'This site is maintained and operated by Learner Services, the Learning Resource Centre and IT Services. For more information please contact us. Frederick University is not responsible for the content of external internet sites.' There are also links for 'University Website', 'Terms of Use', and 'Student Centre - Password'.

**Figure 3: Sample course with downloadable material**

Using these steps, you can proceed and create as many modules/units as deemed necessary, and populate them with a variety of material.

## **6 Training Events Checklists**

The following checklists provide a quick overview of the steps to be taken while organising training events, face-to-face and online.

### **6.1 Running face-to-face training events**

#### **6.1.1 Prior to the training**

- Develop and circulate flyer and invitations
- Take registrations
- Arrange venue and catering
- Send flyer to Christos Anastasiou or George Sotirellis for inclusion on the website
- Notify WP leader for module
- If significant alterations have been made to the presentation, engage with the Project Coordinator
- Set up learning objectives for the course and map these onto the pre-course assessment questionnaire
- Issue pre-course questionnaire to attendees 48 hours prior to the training
- Create and upload an agenda for the day or days of the training
- Register trainees on Moodle for relevant course
- Gather participants' vocation/sector information

#### **6.1.2 For the day**

- Sign-in sheet (with participants' vocation/sector information)
- Daily evaluation form (if longer than one day)
- Trainer competency form
- Issue post-course questionnaire/assessment quiz (at end of training)

#### **6.1.3 Following the day**

- Complete Trainer De-brief sheets and return to work-package leader
- Send completed sign-in sheets, daily evaluation and post-course questionnaires to WP leader
- Organise feedback into summary & tables
- Complete impact assessment form and dissemination table
- Compile Event Report
- Submit invoices from venue & catering to FRC to claim expenses
- Upload material pertinent to the event on Dropbox and inform WP leader and FRC

### **6.2 Running e-learning training events**

#### **6.2.1 Prior to the training**

- Develop and circulate flyer and invitations

- Take registrations
- Send flyer to Christos Anastasiou or George Sotirellis for inclusion on the website
- Notify WP leader for module
- If significant alterations have been made to the presentation, engage with the Project Coordinator
- Set up learning objectives for the course and map these onto the pre-course assessment questionnaire
- Issue pre-course questionnaire and circulate online to attendees 48 hours prior to the training
- Create online assessment questionnaire/quiz form for participants
- Register trainees on Moodle for relevant course
- Gather participants' vocation/sector information

### 6.2.2 For the duration

- Sign-in/register online (with participants' vocation/sector information)
- Issue post-course questionnaire/assessment sheet (at end of training)

### 6.2.3 Following the event

- Organise feedback into summary & tables
- Complete impact assessment form and dissemination table
- Send completed sign-in sheets/participants lists, daily evaluation and post-course questionnaires to WP leader
- Compile Event Report
- Upload material pertinent to the event on Dropbox and inform WP leader and FRC

## 6.3 Using Moodle

Moodle is now set up for each of the two modules. The log-in sheets handed out in March provide details of the log in and you are the teachers for your own countries. All trainers are students of Train the Trainer modules where the latest presentations can be downloaded along with any supporting information. Training on using the e-learning site of the project has been provided through a specialized on-line session held in October 2015.

## 7 Conclusion

The material contained within this handbook provides an overview of the projects' content and can serve as a guideline for organising and delivering further training through either traditional face-to-face sessions or online via distance-learning.

It should by no means be considered exhaustive and/or restrictive, especially when it comes to enriching the training's content or adapting it for different target audiences. That being said, whenever significant changes are made to the core material, FRC should be made aware of and provide consultation on the subject, to ensure that the delivered knowledge maintains its "integrity". The Project's Coordinator can be contacted at [c.anastasiou@frederick.ac.cy](mailto:c.anastasiou@frederick.ac.cy).

The material and guidelines contained herein are pertinent to the UGreenS project and so the handbook should not be used after 30 September 2015, unless prior approval is obtained from the Project's Coordinator.