Green Industry Workforce Development Online Courses

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**Educational Objectives**

The Penn State Extension Green Industry Team conducted a needs assessment in 2017 with green industry professionals across Pennsylvania. Through surveys and interviews, companies were asked to list and prioritize workforce training needs. Using the information collected from the needs assessment and with the support of a $150,000 grant from the Pennsylvania Landscape and Nursery Association (PLNA), 35 green industry workforce development online courses were launched. Twelve courses were launched in 2020, the remaining 23 courses were launched between 2021 and 2022.

The courses were designed for people working or seeking employment in green industry professions including landscape installation and maintenance, plant health care, turfgrass maintenance, and garden center employees. The content is also appropriate for Master Gardeners and avid home gardeners. The courses fall within three learning tracks:

Employee Landscape Training Courses

The objective of the six Employee Landscape Training (ELT) courses is to provide new hires and entry-level professionals with introductory vocabulary and basic skills.

Landscape Workforce Development Courses

The objective of the 23 Landscape Workforce Development Courses is to build on basic skills to help career professionals further develop their expertise so they can advance in their careers or perhaps start their own businesses.

Landscaping Safety Courses

The objective of the six courses in the Landscaping Safety series is to provide information to respond to basic emergency situations and to prevent workplace hazards.

All courses qualify for continuing education credits for the Pennsylvania Certified Horticulturist (PCH) program. Additionally, five of the courses are approved for Pennsylvania Department of Agriculture (PDA) pesticide applicator recertification credits.

**Program Activities and Teaching Methods**

All courses are online and self-paced, using the Open edX platform. The courses feature videos, images, short readings, and knowledge check questions. The knowledge check questions include multiple choice, true or false, drag and drop, matching and case study formats. Participants are given feedback on both correct and incorrect choices. The courses have a variety of other tools and resources, including a glossary, resource links, handouts, and references.

Courses range from 30 minutes to 9 hours in estimated course completion time. They are divided into short sections; at the end of each course section, the participant completes a quiz. They must achieve an 80% score to advance. If they do not pass, participants can review the section and take the quiz again. The participant has access to the course for one year after registration, so they can complete the course on their own schedule.

The team members wrote the course content including video scripts, short readings, and assessments, and provided images and video clips. We would like to acknowledge the College of Ag Digital Education Team at Penn State University, which was instrumental in producing the course video and managing the course platform. They ensured the accessibility of the courses with features like closed-captioning, accessible text scripts and alternate text for images.

**Evaluation**

A standard, optional evaluation was used at the end of each course. Participants were asked to provide a self-evaluation of knowledge gained, and to share whether they planned to implement the knowledge they gained in their work or daily life. They were also asked if they had suggestions for course improvements or for future courses.

**Results**

The following table lists the evaluation data collected for the 35 online courses over the past three years, (January 1, 2021, through December 31, 2023).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Course | N= course  completions | n= evaluation  completions | % reporting knowledge  increase | % reporting  Intension to implement  knowledge | Revenue  Generation |
| ELT: Introduction to Soils | 75 | 22 | 64% | 77% | $2,154.00 |
| ELT: Symptoms and Signs of Plant Health Problems | 261 | 67 | 93% | 94% | $8,791.00 |
| ELT: New Lawn Establishment | 73 | 17 | 35% | 71% | $2,017.00 |
| ELT: Pruning Basics | 140 | 56 | 79% | 93% | $5,672.00 |
| ELT: Planting, Mulching, and Watering | 111 | 31 | 65% | 87% | $4,161.00 |
| ELT: Reading Landscape Plans | 30 | 9 | 67% | 67% | $1,655.00 |
| Plant Biology, Taxonomy, and Morphology | 56 | 22 | 95% | 95% | $4,123.00 |
| Soils and Plant Nutrition for Ornamental Landscapes | 22 | 4 | 100% | 100% | $3,061.00 |
| Plant Establishment and Maintenance | 16 | 6 | 83% | 100% | $4,102.00 |
| Pest and Disease Management for Landscape Plants | 64 | 16 | 100% | 74% | $9,892.00 |
| Pruning Small Trees and Shrubs for Landscapers | 33 | 13 | 85% | 100% | $5,501.00 |
| Weed Management for Ornamental Landscapes | 162 | 43 | 88% | 91% | $14,407.00 |
| Plant Health Diagnosis: Assessing Plant Diseases, Pests and Problems | 542 | 128 | 80% | 95% | $28,573.00 |
| Turfgrass Installation and Management | 91 | 24 | 71% | 100% | $7,064.00 |
| Design Basics for Residential Landscapes | 35 | 14 | 86% | 93% | $6,521.00 |
| Plant Identification: Shade Trees | 26 | 4 | 100% | 100% | $2,776.00 |
| Plant Identification: Shade Trees | 24 | 8 | 100% | 88% | $ 2,456.00 |
| Plant Identification: Coniferous Trees | 11 | 5 | 100% | 100% | $1,311.00 |
| Plant Identification: Deciduous Shrubs | 13 | 2 | 100% | 50% | $1,757.00 |
| Plant Identification: Broadleaf Evergreen Shrubs and Groundcovers | 10 | 1 | 100% | 100% | $1,482.00 |
| Plant Identification: Coniferous Shrubs and Groundcovers | 7 | 1 | 100% | 100% | $ 943.00 |
| Plant Identification: Groundcovers | 1 | 0 | 0 | 0 | $677.00 |
| Plant Identification: Vines | 1 | 1 | 100% | 100% | $223.00 |
| Plant Identification: Native Plants | 42 | 15 | 87% | 100% | $4,157.00 |
| Plant Identification: Ornamental Grasses | 1 | 1 | 100% | 100% | $1,011 |
| Plant Identification: Plants for Green Infrastructure | 10 | 6 | 67% | 83% | $895.00 |
| Plant Identification: Herbaceous Perennials | 19 | 3 | 100% | 100% | $2,673.00 |
| Plant Identification: Annuals and Biennials | 2 | 0 | 0 | 0 | $920.00 |
| Plant Identification: Bulbs & Other Geophytes | 5 | 4 | 100% | 100% | $568.00 |
| Landscaping Safety: Basic Worksite Safety | 28 | 1 | 100% | 100% | $478.00 |
| Landscaping Safety: Emergency Preparedness and First Aid Basics | 28 | 2 | 100% | 100% | $674.00 |
| Landscaping Safety: Vehicle and Transporting Equipment | 24 | 3 | 67% | 67% | $491.00 |
| Landscaping Safety: Basic Power Equipment | 29 | 2 | 0% | 50% | $581.00 |
| Landscaping Safety: Pruning and Tree Work Safety | 30 | 1 | 100% | 100% | $627.00 |
| Landscaping Safety: Pesticides | 8 | 3 | 67% | 100% | $353.00 |
| TOTALS | 2,030 | 535 | 81% | 91% | $132,747.00 |

**Impact Statement**

Between January 1, 2021, and December 31, 2023:

* 2,030 participants completed courses; 535 participants completed evaluations.
* 81% of participants reported an increase in knowledge.
* 91% of participants reported the intension to implement the knowledge they gained in the course in their work or daily life.
* 1,120 participants earned Pennsylvania pesticide applicator recertification credits.
* The courses generated $132,747.00.

Participant comments:

* *“It was great. I like the short presentations. and then the questions. Thank you.”*
* *“I thought this course was the right amount of video, quiz and reading material to make it very engaging!”*
* *“This course was the most thorough educational online program I've taken. It took me 12 hours plus. Not sure you could improve it. Thanks!”*

Business manager comments:

* *“It was helpful to me as an employer to help train my employees.”*
* *“The landscape training videos are really good. We’ve seen improvements in our crew’s work. We can tell the difference between the work of the crews that have completed the trainings and the crews who haven’t done the training yet.”*

Some participants gave feedback for course improvement and made requests for future course development. The most frequent request was for more printable materials to use as references in the field. We also received requests for more courses that award pesticide applicator recertification credits. We will review each course every three years to update information and create additional content, including more printable materials and add additional interactive assessment activities.