

PLANET's Occupational Analysis for Educational Programs: Student Competency Matrix

INTRODUCTION

A Competency Matrix allows students to identify knowledge and skills that are relevant to a particular field, and self-assess their progress toward expertise in these targeted areas. In 2009, faculty at Brigham Young University completed a three-year effort to develop a competency matrix for their students enrolled in Landscape Management. The goal was to include the knowledge, skills and abilities of value to Green Industry employers. Lists of competencies were obtained from the employee evaluation documents of several PLANET-member companies, as well as a review of PLANET Certification manuals. Aims of that competency matrix included:

- Direct students in selection of classes, participation in extracurricular activities, work experiences and internships that would maximize their worth to employers upon graduation;
- Provide a tool for increasing the value of internship experiences (i.e., by providing students with a knowledgeable basis upon which to negotiate for specific experiences that would produce the additional skills they need);
- Allow students to more effectively market their knowledge and experience;
- Provide a basis for more meaningful counseling with a student's faculty advisor.

In 2010, The Caviart Group LLC (<http://www.thecaviartgroup.com>) and the Professional Landcare Network (<http://www.landcarenetwork.org>) released a copyrighted document "Interpreting PLANET's Occupational Analysis for Educational Program Design". This document defines the "tasks, knowledge, and skills required to competently perform exterior landscape installation and maintenance". While the Occupational Analysis (OA) was completed in order to form the basis for certification testing, the content of the OA has obvious value to educational programs that offer degrees related to landscape contracting.

Here are just three brief examples of how the OA can be used to benefit educational programs. First, alignment of an educational program with the OA can be used to justify the relevance and importance of the program to administrators. Second, students that graduate from such a program, with both the knowledge and skills indicated by the target competencies, should largely be prepared for PLANET's Landscape Industry Certified Technician exam. And third, the competencies indicated can form the basis for defining student learning outcomes and the assessment measures that support them.

The following spreadsheets ("Softscapes", "Hardscapes", "Irrigation" and "Safety") provide the content of the 2010 OA report in the same Competency Matrix format that was developed for students at Brigham Young University. This is made available for educational use, with permission from The Caviart Group, PLANET and Brigham Young University.

Softscapes (Plants, soil, mulches)

	No Skill	Exposure	Apprentice	Expert
Components of the landscape plan				
Recognizing plan symbols				
Using different scales				
Interpreting details, specs, and notes				
Calculating areas and volumes				
Principles involved in layout				
Measuring horizontal distances				
Marking Locations				
Placing landscape materials				
Landscape equipment/tools				
Operating equipment responsibly				
Using tools properly				
Equipment/tool maintenance				
Methods and standards for site preparation				
Preserving existing plants/structures				
Removing unwanted plants/structures				
Minimizing soil erosion				
Plant Identification				
ID trees, shrubs, herbaceous plants, and ground cover				
Plant cultural requirements				
Recognizing the relationship between plant requirements and site conditions				
Methods of grading and drainage				
Operating survey equipment to determine elevation				
Calculating difference in elevation				
Finish grading of site				
<i>(CONTINUED PAGE 2)</i>				

No Skill: No previous skill in the target competency

Exposure: Observed a competent professional demonstrating the skill

Apprentice: Completed relevant activity under supervision of a competent professional

Expert: Qualified to supervise other individuals in competency area

Softscapes (Page 2)

	No Skill	Exposure	Apprentice	Expert
Methods of soil amendment				
Incorporating amendments				
Methods of planting				
Digging planting holes				
Praparing plant				
Placing plant				
Backfilling hole				
Staking and/or guying				
Extablishing turfgrass				
Laying sod				
Applying seed				
Plugging				
Sprigging				
Methods of Mulching				
Identifying mulch types				
Applying mulch				
Fertilization				
Reading fertilizer labels				
Calculating areas and volumes				
Calibrating fertilizer equipment				
Operating fertilizer equipment				
Principles and methods of Pruning				
Recognizing cultural needs of the plant				
Selecting appropriate pruning tools				
Performing pruning operations				
Cleaning up of debris				
(CONTINUED PAGE 3)				

No Skill: No previous skill in the target competency

Exposure: Observed a competent professional demonstrating the skill

Apprentice: Completed relevant activity under supervision of a competent professional

Expert: Qualified to supervise other individuals in competency area

Softscapes (Page 3)

	No Skill	Exposure	Apprentice	Expert
--	----------	----------	------------	--------

	No Skill	Exposure	Apprentice	Expert
Turfgrass culture practices				
Mowing				
Trimming				
Aerating				
Dethatching				
Edging				
Top dressing				
Overseeding				
Principles of integrated Pest Management				
Monitoring				
Identifying pest/disease				
Recognizing thresholds of damages				
Using appropriate control measures				
Reporting				

No Skill: No previous skill in the target competency

Exposure: Observed a competent professional demonstrating the skill

Apprentice: Completed relevant activity under supervision of a competent professional

Expert: Qualified to supervise other individuals in competency area

Hardscapes

No Skill

Exposure

Apprentice

Expert

Plan reading/site calculation

- Measuring plan with a scale
- Laying out the design
- Interpreting drawing symbols
- Interpreting written specifications
- Performing basic landscape math

Equipment and tools

- Operating equipment correctly
- Performing basic equipment maintenance

Site demolition

- Removing unwanted plants and structures

Excavation/Grading

- Installing sub-surface drainage components
- Adjusting site topography

Soil Structure

- ID soil types and taking proper action
- Compacting sub-grade and base material

Aggregates

- Installing aggregate
- Installing sand

Paving materials

- Installing paving material

Basic wall and wood construction

- Installing wall material
- Performing basic carpentry

Basic outdoor lighting and amenities

- Identifying components of lighting systems
- Instal site amneties(trashcan, bench, etc)

No Skill:

No previous skill in the target competency

Exposure:

Observed a competent professional demonstrating the skill

Apprentice:

Completed relevant activity under supervision of a competent professional

Expert:

Qualified to supervise other individuals in competency area

Irrigation

No Skill

Exposure

Apprentice

Expert

Trenching and pipe pulling

- Marking trench locations
- Operating trenchers and pipe pullers

Programming controllers

- Programming a controller as directed

Basic Electricity

- Recognize relationship between controllers and remote control valves
- Making proper wire connections

Basic hydraulics

- Measuring GPM and PSI
- Calculating pressure loss due to friction
- Recognize effect of elevation change on PSI
- Recognizing relationship between velocity and surge pressure water hammer
- Recognizing the relationship between GPM and sprinkler output

Installation

- Installing pipe, fittings, and components
- Backfilling and compacting
- Mounting and wiring controllers and valves
- Flushing, nozzling, and adjusting of sprinkler heads

Maintaining

- Troubleshooting the electrical and hydraulic components
- Replacing/repairing damaged components

(CONTINUED PAGE 2)

No Skill: No previous skill in the target competency

Exposure: Observed a competent professional demonstrating the skill

Apprentice: Completed relevant activity under supervision of a competent professional

Expert: Qualified to supervise other individuals in competency area

Irrigation (page 2)

	No Skill	Exposure	Apprentice	Expert
Winterizing system				
Charging system				
Soil Types				
Recognizing water, soil, & plant relationships				
Plan Reading				
Identifying components of an irrigation plan				
Methods of Irrigation				
Recognizing the delivery methods for water				

<u>No Skill:</u>	No previous skill in the target competency
<u>Exposure:</u>	Observed a competent professional demonstrating the skill
<u>Apprentice:</u>	Completed relevant activity under supervision of a competent professional
<u>Expert:</u>	Qualified to supervise other individuals in competency area

Safety

No Skill

Exposure

Apprentice

Expert

Knowledge of equipment

- Maintenance schedule
- Safety features
- Operators manual

Knowledge of motor vehicles

- Maintenance schedule/pre-trip inspection
- Operators manual
- Combination vehicles

Knowledge of safe working practices

- Proper lifting techniques
- Methods of material handling
- Personal protective equipment

Knowledge of product information

- Label
- MSDS

Additional skills in:

- Performing safety check for tools/equipment
- Recording in logbooks
- Transporting equipment and materials
- Storing tools properly
- Performing site inspections to ID hazards
- Reading labels, MSDS and operator manuals
- Establishing safe work areas
- Initiating emergency response
- Ensuring underground utilities are identified, located, and marked before excavation

No Skill:

No previous skill in the safety target

Exposure:

Observed safe demonstration by a competent professional

Apprentice:

Safely demonstrated skill under supervision of a competent professional

Expert:

Can safely supervise other individuals in competency area