Please outline the following for each lesson

Course Title

Lesson Title

Site Surveys and Preplanning

Background

Lesson Stage

Introductory/Instructional/or Culminating

This is an instructional level module in developing content and skills

Intended Audience

Who is the intended audience?
What skills and prior educational experience is required to participate in this lesson?

Grades 9-14

Designer's Name & Contact Email

Include this information so instructors have a resource to contact when implementing the lesson.

Leo E. Remillard e-mail remillard@tri-county.tc or lremi@comcast.net

Nacy Sibilia e-mail sibilia@tri-county.tc

Goals & Focus

General Topic

For example: Wind Energy or Photovoltaic

Photovoltaic

Central Questions/Overall Purpose/Key Content Ideas Taught in this Lesson

What is a general or central question that the lesson asks?

Provide an overall summary of the lesson objectives

Please outline the following for each lesson

1) What environmental concerns can dictate the design and placement of a PV system?

2) For optimal desired output, should the orientation of the array be southwest or south?

3) What factors should be taken into consideration when selecting a site for the installation?

Identify factors examined in a preliminary assessment, including the local solar resource, environmental conditions, and building code and utility interconnection requirements.

Explain the process of determining potential array locations.

Describe methods for determining and diagramming shading patterns.

Discuss considerations in determining the suitability and condition of existing roofing, structural systems, and electrical systems and equipment.

Explain the function of an energy audit and identify opportunities for energy conservation and energy efficiency.

Identify factors to be considered when preparing a proposal, including estimates for cost, size, performance and value of a PV system.

Explain the purpose of date monitoring and discuss options for collecting system data.

Lesson Duration

How long will it take to complete the lesson?

6 hours

Related Learning Standards (if applicable)

Please refer to any work-based and/or academic learning standards that may apply to this lesson/course.

2.C.O.7 Explain the different types of meters and equipment used to measure voltage, current, resistance and power.

Show students different carpentry tools needed to perform a proper site/roof analysis.

Show students proper method of using the sun path calculator.

Intended Learning Outcomes

Outcomes should be "SMART"

Please outline the following for each lesson

Specific – Objectives should specify what they want to achieve.

Measurable – You should be able to measure whether you are meeting the objectives or not.

Achievable - Are the objectives you set, achievable and attainable?

Realistic – Can you realistically achieve the objectives with the resources you have?

Time – When do you want to achieve the set objectives?

a) Students will be able to identify customer concerns and site issues that may arise during a preliminary assessment.
b) List common types of equipment needed to conduct site surveys.
c) Identify factors to consider when choosing potential array locations.
d) Identify factors to consider when conducting a shading analysis.
e) Describe the functions of a sun path calculator.
f) Identify the features of the profile angle shading analysis method and the photographic method.
g) Identify the main reasons to consider accessibility when conducting site surveys.
h) List factors to consider when conducting a roof evaluation.
i) Identify factors to consider when conducting an electrical assessment.
j) List issues to consider when formal planning for installations begins.

KNOW

By the end of this lesson students will know...

This may include facts, names, dates, places, information, vocabulary.

By the end of this lesson the students will know how to properly use a solar path calculator and the purpose of it. Student will also know the following vocabulary: site survey, magnetic declination, profile angle energy audit, photographic shading analysis.

UNDERSTAND

By the end of this lesson students will understand....

This may include big ideas, generalizations, principles, ideas that transfer across situations.

Students will understand why it is very important to observe and perform a comprehensive site survey before an installation is started.

DO

By the end of this lesson students will be able to....

This may include skills of the discipline, social skills, production skills, and processes.

Students will be trained to the proper use of all tools and equipment necessary to perform a comprehensive site survey.

Implementation

Pre-Assessment

How will you determine students' prior knowledge and understanding for this unit?

Please outline the following for each lesson

What data will you collect?

How will you survey prerequisite learning?

Question and answer period to see how much knowledge students have of the proper tool and equipment use.

Resources & Materials

Attach copies of handouts, slides or visuals required

What equipment is needed to conduct the activities in the lesson?

What do the students need to be able to participate in the lesson?

Guest speaker and presenter, demonstration on proper use of solar Pathfinder and the Photographic Shading Analysis'

Photovoltaic System Textbook (American Technical publisher, Inc.) ISBN 978-0-8269-1287-9 and related Power Point

Activities Plan (Optional)

Provide as much detail as possible so that an instructor/trainer could use this plan to teach the course.

This may include a step by step action plan, teaching methodologies or types of activities (e.g. group work, lecture, case study, etc)

Each Lesson may have several activities.

For each activity provide a title and identify the duration of the activity.

For each activity outline the steps the instructor will take to complete the activity.

As a group students will do an actual site analysis using all the proper tools to calculate roof angles, evaluate electrical power and load, proper site survey of roof and properly document all information.

Assessment/Demonstration of Competencies

How will the students be assessed on what they have learned?

Review questions throughout presentation and interaction with students.

Test which will consist of True & False, Multiple choice, and Essay Questions.

All necessary reports will be reviewed for accuracy.