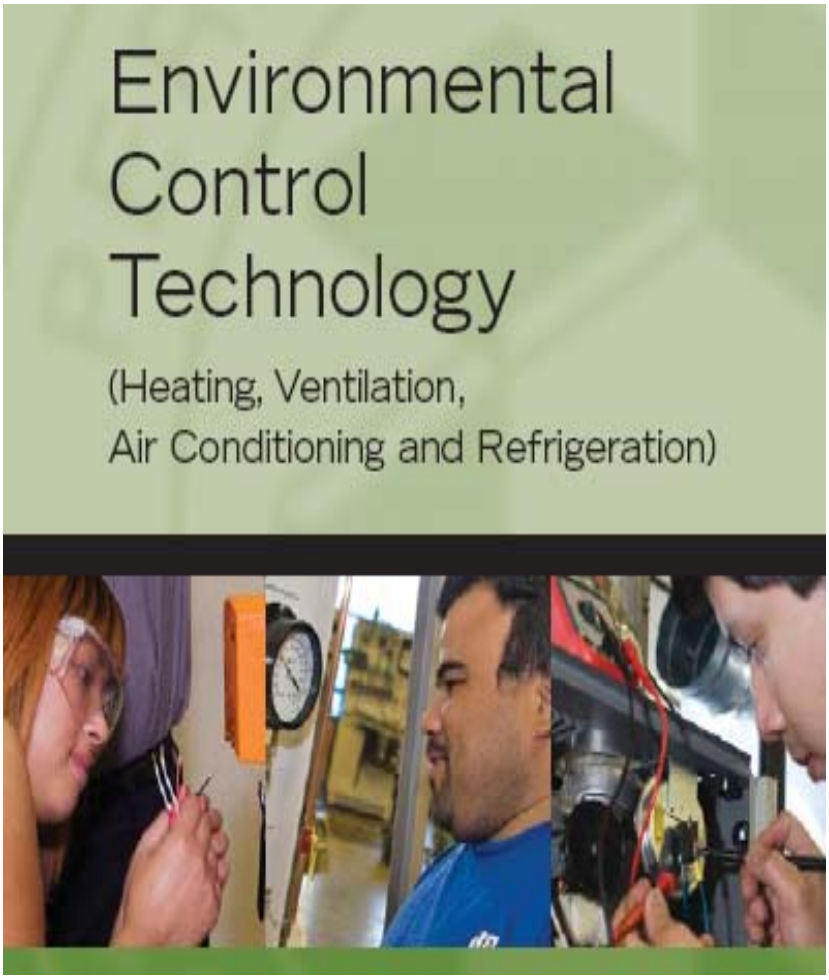
Laney College

PROBLEM BASED LEARNING



ECT 18: Residential and Light Commercial HVAC Installation

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Overview: Problem Based Learning (PBL) Scenario

The problem base learning scenario will be broken down into the following class sessions and course concepts.

CLASS SESSION: 1-3
In class: [] Introduction to Problem Based Learning (PBL) Approach [] Divide the class into groups (4-5 people per group) [] Receive the assigned Problem Based Learning scenario [] Review design and installation fundamentals [] Introduction to manual and software load calculation
Outside of class: [] Analyze the problem • Create a file folder that includes the documentation of the problem and its process (For example: Recording your thought process, digital pictures of the house, gathering resources and information)
CLASS SESSION: 4-7
In class: [] Identify and fix the problem [] Gather information • Use "Need to Know" to compile facts (see packet for worksheet) • Perform design and installation procedures (which include but are not limited to: Load calculations, proper register location, cutting floors, sizing and properly installing duct work, installing vent pipes and gas lines, and electrical wiring)
Outside of class: [] Continue documenting the problem and its process [] Create a group Power Point Presentation that identifies the problem and provides a solution(s) • Divide the tasks among the group members so that each person presents a different section of the presentation (1-2 minutes per group member) • The day of the presentation group members must dress in professional/business attire • Final presentation components must include: individual and team evaluations (see packet for guidelines)
CLASS SESSION: 8
In class: [] Turn in a completed Portfolio (binder) containing the documentation of the problem and its process from beginning to end [] Class Final - Group Power Point presentations and turn in completed evaluations

PROBLEM BASED LEARNING (PBL) SCENARIO

Instructor: Nick Kyriakopedi
Course: Residential and Light Commercial HVAC Installation Practices
Course Number/Code: ECT 18

SCENARIO TITLE

"Installation of a furnace in a Residential House"

Course Concept:
The course concept used in this scenario is how to properly size and install a furnace in a residential house.

SCENARIO DURATION

The problem base scenario will be integrated and performed within eight class periods.

BUSINESS PARTNER

Laney College, Environmental Control and Technology (ECT) Department

LEARNING OBJECTIVES

By the end of the semester, students will be able to demonstrate the ability to:

- Collect, organize, and analyze information
- Determine the problem, provide solution(s) and recommendations
- Properly install equipment
- Create a Portfolio (binder) that documents the problem and its process
- Properly size equipment
- Safely handle materials and tools used for cutting, bending, etc
- Follow proper and safe techniques when wiring, installing ducts and gas pipes
- Demonstrate proper procedures when measuring, cutting and threading black pipe
- Explain local and state code requirements for proper installation practices
- Demonstrate good communication skills when working with peers in teams

THE FOCUS OF THE PROBLEM

- The focus of this Problem Based Learning (PBL) scenario is based around a real life scenario.

In various settings, the Problem Based Learning (PBL) scenario may be presented as a real time problem, hands-on scenario, or hypothetical problem. Using critical thinking and investigation skills, the students go through a process to solve a problem and provide recommendations for a solution.

PROBLEMATIC SITUATION

As winter approaches, Nick needs to install a furnace to keep his house warm. Nick would like to hire a contractor to identify the type of furnace he needs and where to install it taking into consideration the design, location, and aesthetics of his house. As a group, identify how to gather the information and the steps required to properly install a new furnace considering Nick's needs and expectations.

STUDENT MATERIALS

The instructor will provide students with the following information:

- A copy of the Problem Based Learning (PBL) cycle and steps
- An explanation of the Problem Based Learning (PBL) approach
- Worksheet: "Need to Know Board" to gather information
- Worksheet: Scoring rubric for final presentation
- Worksheet: Team members evaluation
- Problem Based Learning (PBL) scenario evaluation online survey

Resources and Media:

- Internet
- Educational materials and books
- Industry resources
- Videos, CD and DVD on HVAC equipment

Required Supplies:

- Pencils and colored felt tip pens
- Graph paper with 1/8" squares
- Circle template
- Line paper
- Safety glasses
- Gloves
- Medium flat blade and Philips screwdriver
- 1/4" and 5/16" nut drivers
- Two adjustable wrenches one 8" and one 12"
- Tool box or pouch

Recommended Tools:

- Power drill
- Sheet metal cutters
- Sheet metal bender
- Hammer
- Socket set

INSTRUCTOR ROLE

The instructor will support the Problem Based Learning (PBL) experience by:

- Introducing the scenario and its process
- Facilitating reflection and discussion
- Providing applicable resources and materials
- Answering any questions related to the scenario and coursework
- Providing class time to work on the scenario

STUDENT ROLE AND GUIDELINES

Individual

The intended outcome will be measured by having each student:

- Demonstrate safe installation procedures
- Perform proper and safe use of tools
- Collect information in order to identify and solve the problem
- Demonstrate a specific individual role in their team
- Execute a specific individual role in the final presentation
- Complete a Problem Based Learning (PBL) scenario evaluation as a part of the final project

Group: Each group will consist of 4-5 students

The intended outcome will be measured by providing:

- A Power Point presentation where each student will dress in business attire and orally present a part of the group presentation (1-2 minutes per group member)
- Compile a file folder that includes the documentation of the problem and its process

STUDENT FEEDBACK

As a team, and individually - students will review, assess and provide feedback regarding the Problem Based Learning (PBL) scenario experience.

Requirements of the final project:

- Completion of a short Problem Based Learning (PBL) questionnaire
- Completion of a short team member evaluation

TEAM LINK

The instructor will support the team learning process by:

- Allocating time to meet during class
- Encouraging students to use additional time outside of class and on the phone to work on the scenario