

A living Laboratory: Activity Template

Activity Title: Draw the three orthographic views of an object

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Activity Description:

In order to describe a shape of an object, the three orthographic views (Top view, Front view and right side view) are drawn.

Learning Goals:

Teach the student to be able to communicate with accuracy and time limit the object shape using Engineering Drafting (AutoCAD) as a tool of communication.

Timing:

Prior to this assignment, the student learned how to use AutoCAD (engineering drafting) as a tool for drawing. The student also learned the notion of orthographic views and already practiced on simple objects in class and through previous homework assignment. This activity is used in the second part of the semester (week 9-15) where student develop skills of visualization and use AutoCAD as a tool of communication.

Logistics:

- 1. First, teach students how to use the tool of communication (in the first part of the semester)*
- 2. Second, convey the notion of orthographic views,*
- 3. Then, teach students to be organized: the steps to follow to get to the three orthographic views (final description of the object)*
- 4. Finally, Help students to develop skills of visualization: how to describe a three dimensional object using two dimensional views.*

General Education SLOs:

This activity addresses knowledge and skills:

- Learn and appreciate Engineering Drafting,*
- Understand the use of AutoCAD as a tool of communication,*
- Appreciate the relationship of engineering drawing to the professional applications.*
- Develop observation skills and use scientific reasoning.*
- Use these skills to be creative and innovative: the student can create an object by*

*drawing it then manufacturing (**making**) it at the lab*

High Impact Educational Practices:

Place-Based learning (MET Lab): *a manufacturing lab is available at the Mechanical Engineering Technology department. In order to connect the student to the professional application, the student is able to create an object by drawing it, then manufacturing it at the lab.*

Open Digital Pedagogy (the OpenLab): *used for interactions between students and professor: handout posting, exercise solution posting and exchanges.*

Assessment: *by questioning students and discussion. Grade calculation is also included*

Reflection:

The challenges encountered were:

- *how to help the student visualize an object (think of it as a three dimensional) using two dimensional views,*
- *how to help the student understand Engineering drafting as a tool for communication and not only tool for drawing.*

To address these challenges, I use the notion of engineering drafting as a “language” for engineering designers to communicate their idea. This concept made a lot of students more interested and curious about the academic discipline.