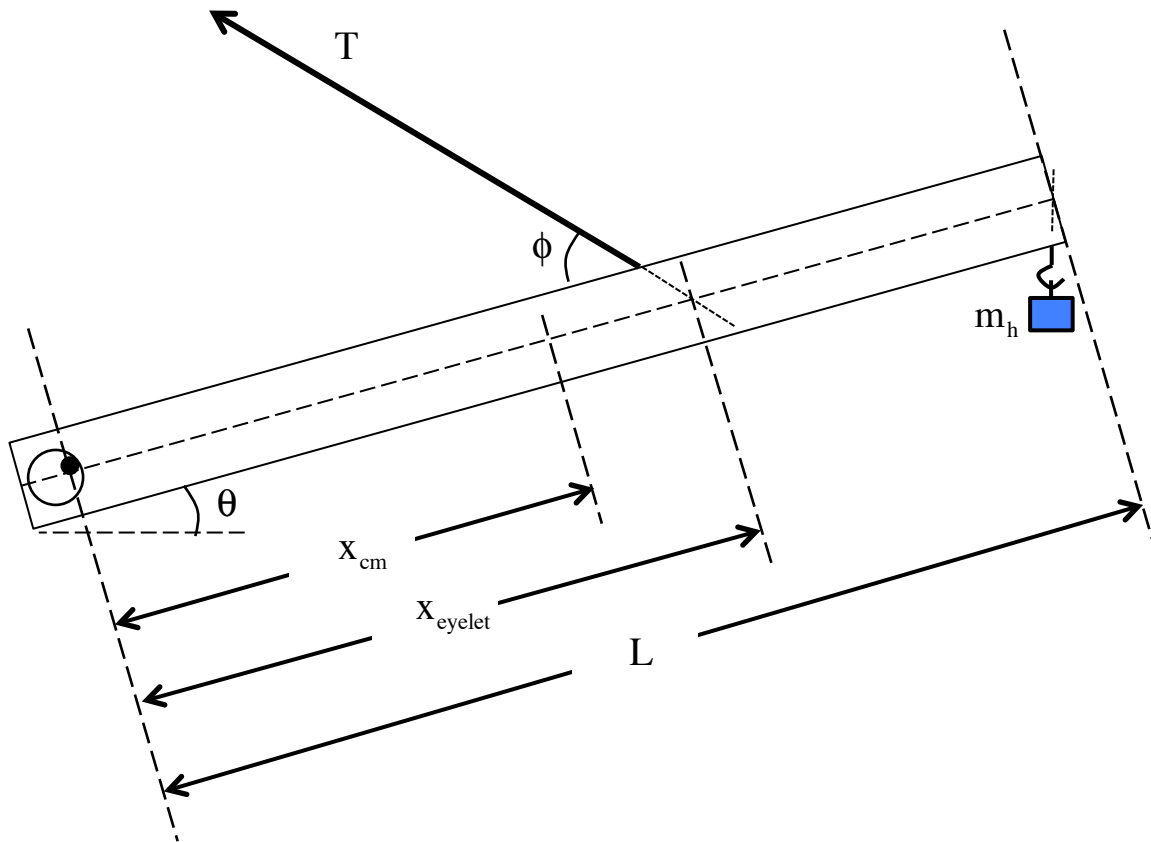


## Truncated Rigid Body Lab (L-56)

The set-up is shown below.



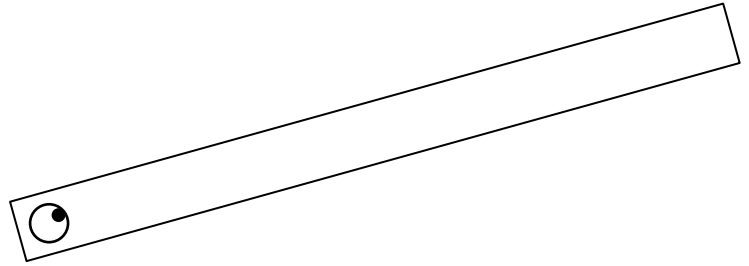
For data taking:

- 1.) Turn the computer on and open the Logger Pro program. Connect a Force Transducer and check to see if it is calibrated. If not, calibrate it. Note that once you get it placed in the system, you will have to zero it.
- 2.) Set up the system. A mock set-up will be shown at the front of the room.
- 3.) Place a 100 gram mass at the end of the beam (i.e., on the hook at the end) and record the tension in the line using the Force Transducer.
- 4.) Make the measurements identified in the sketch above (three lengths and two angles). List them below along with the mass of the beam.

Name: \_\_\_\_\_ Period \_\_\_\_\_

For Write-up:

1.) Starting with a f.b.d. on the beam (use the sketch provided below). Note that the force components at the pin should be H and V.



2.) Using the parameters defined in the sketch, derive an algebraic expression for the theoretical tension  $T_{\text{theo}}$  in the cable. (Hint: All you need to do is sum the torques about the pin to do this.)

3.) Using the equation derived in #2 and the values measured during class, determine the theoretical tension required to hold the beam in place.

4.) Do a % comparison between the experimentally observed and theoretically calculated tension in the line. Comment *briefly*.