

Lab 3: Force Evaluation

1 Assignment

At your lab station, you have an inclined plane and a block with two different surfaces: bare wood and rubber. Your team has been tasked with:

1. determining the coefficients of static friction (μ_s) for the two different materials
2. determining the coefficients of kinetic friction (μ_k) for the two different materials
3. experimentally determining the dependence that μ_s and μ_k have on the surface area in contact

2 Deliverables

For your lab report, 10% of the grade will be for following the guidelines in the lab report template. Another 10% will be allocated for the Abstract and Introduction of your report. The remaining percentage will be based on your inclusion of:

- for assignment 1:
 1. [12.5%] a description of the process your team developed to perform these measurements
 2. [10%] the values you determined for the coefficients of static friction (μ_s), along the uncertainties associated with these measurements
- for assignment 2:
 3. [12.5%] a description of the process your team developed to perform these measurements
 4. [10%] the values you determined for the coefficients of kinetic friction (μ_k)
 5. [10%] a 95% confidence interval estimate for your kinetic friction coefficients, using a *minimum* of 9 trials
- for assignment 3:
 6. [12.5%] a description of the process your team developed to assess the dependence on surface area contact
 7. [12.5%] your conclusion of how the coefficients of friction depend on the surface area in contact. This conclusion should be supported with data and should discuss whether or not two measurements agree with each-other within uncertainty.

3 Technical Information

3.1 Using the tracking camera

For this lab, you may run the `6_track_motion_and_print.py` script in the `examples/tracking` directory. Make sure you set the `camera_distance` variable, in centimeters, in the script in order to get correctly calibrated data.