

Design Contest
ME72 Engineering Design Laboratory
Fall Term, 1998
Analysis Assignment

Assigned: Thursday October 22nd

Due: Thursday October 29th

Perform one of the following analyses for the design of a contest device. Describe the assumptions you make, and briefly justify them. For example, you might assume that your opponent's device has a certain weight (mass) and coefficient of friction with the arena. It is usually best to make *conservative* assumptions, *i.e.*, assume that your opponent is bigger, heavier, stickier, and more capable than is likely, so that your device will perform better (or at least no worse) than shown by your analysis.

1. Analyze at what speed and with what force your device (or a device that you might consider building) can push an opponent device. A steady-state analysis is acceptable, but including the acceleration of the mass(es) would be better. What transmission ratio and wheel size (effective wheel radius) did you choose? Why?
2. Analyze a method for throwing a ping-pong ball towards the goal. Consider the power and energy available by the source that you choose to analyze (*e.g.*, 12 volt motor or 2 rubberbands). How far can this method throw a ping-pong ball? What might you do to improve the accuracy of this method?