Module 1: Vertical Gear

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures
Gear able to lift pet door Teeth on the door able to grip gear	Large enough and strong enough gear Durable material	$T = F*r*\sin 0$ Torsion = Tc/J $F=MA$	Physics Solid Mechanics	Gear could fail Material could break	Sturdy material Gear able to handle stresses Use a sturdy and tested motor

Module 2: Horizontal Gear

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures
Have a track that can support and navigate door along path Have a gear/motor strong enough to slide door across track	Track along bottom edge to support Gear and motor positioned to achieve full range of motion	$T = F*r*\sin 0$ Torsion = Tc/J $F=MA$ Friction force = $N * Uf$	Physics Solid Mechanics	Door could be too long for gear Door could tip instead of slip	Make sure gear and motor are positioned optimally Ensure that force is enough to cause slippage

Module 3: Vertical Pulley System

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures

Have winch to pull cord/ wire Have pulley system to lift door Have vertical track system to keep door alligned	A pulley large enough extend past door Winch strong enough to lift door Vertical track system	$F = M*a$ $T = F*r*\sin0$ Torsion = Tc/J	Physics 2156 Spreadsheet Solid Mechanics	Wire could break Winch/motor could fail Door can become unaligned Loop for wire breaks on door	Sturdy material Sturdy wire Use a sturdy and tested motor Track with low clearance to avoid becoming misaligned