

Statics, dynamics, and bungee jumping

Cormac Flynn

Wintec

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Engineering Mechanics Project

- Worth 20% of total marks
- Associated learning outcomes
 - 1 Understand and analyse basic theory and principles of forces in mechanics and their relationship to engineering applications
 - 2 Analyse motion, forces and motion, work and energy problems and their relationship to engineering applications
- Traditional labs and lab report in the past
- Goal was to replace with a student-centred project

Students brainstormed project ideas

Mechanics Project Ideas

Post up some ideas of what you would like to build for the project. A crane? A bridge?

Project details so far

1. You will work in groups
2. You will demonstrate your project to the class in some form
3. You will submit an individual report
4. It is worth 20% of the total marks for this module

Learning outcomes of project

You will need to build something that demonstrates that you are able to:

1. Understand and analyse basic theory and principles of forces in mechanics and their relationship to engineering applications
2. Analyse motion, forces and motion, work and energy problems and their relationship to engineering applications

Ballista - Large-Scale Glider - Truss Bridge (to hold Human weight)

cramp

Eiffel tower

Building with a free hanging deck

Suspension Bridge

Seesaw

Guillotine
for cigars...

table
turn table

popsicle power pylo

tunnel

Crane

Rotating Table

arch way

Hoist

pendulum or swing

a wobble board

swing bridge

hot air balloon

like a crane

a building with a free hanging deck

rocking chair

water wheel

fountain

a pulley for something

pulley system eg gondala

Windmill

bungee jumps platforms

catapult

planes

hot air balloon

draw bridge

car

tip trailer

bridge

crane

ferris wheel

monuments

potato masher tool

tower

window cleaning platform

swing bridge

lift

wrecking ball

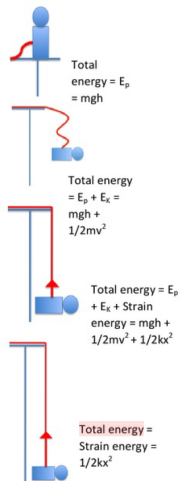
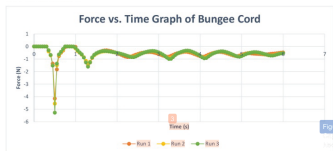
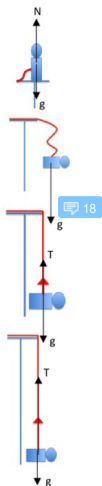
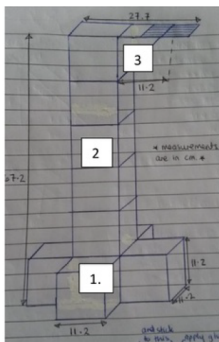
clock

Project format

- Group size 3-4
- 1-2 hours per week in class
- Group presentation (25%) and individual report (75%)
- Some tower specifications
 - 1 Minimum platform height 500 mm
 - 2 Minimum cantilever platform length 150 mm
- Performance criteria for competition

$$\textit{Tower Performance} = \frac{\textit{Bungee jumper mass} \times \textit{Platform height}}{\textit{Tower mass}}$$

Activities to achieve outcomes



Project outcomes

- Student feedback
 - Generally positive
 - A couple of minor issues with group dynamics
 - Introduce earlier so more time to design
 - Everyone hated the PVA glue
- Good engagement - much better than for traditional labs
- Unintended learning outcome: adoration of tutor

