
IEEE UAE STUDENT DAY**2023****Engineering Design Project (EDP) Competition****Mechanical Car Gearing System****GENERAL INFORMATION**

This competition is intended to allow students to explore the art, science and hence infinite possibilities of system design. This project aims to build a cost-effective and efficient car along a gearing system that can carry a load of up-to 2 kilograms within a distance of 3 meters in the least amount of time.

Students in the first/second year of their engineering education are particularly encouraged to participate. They can show their creativity and innovative designs and have fun!

A panel of three judges, to be selected by the IEEE UAE Students Day steering committee, will assess the entries to the competition. The competition rules are given below.

COMPETITION RULES:

1. Undergraduate engineering students within the UAE are eligible for this competition.
2. Each institution can submit a maximum of two teams for judging in this competition. Each competition team should have no more than four students.
3. The system will be tested indoors using a 3-meter-long track, 30 cm Width with a fence height of 5 cm. The time will start as soon as the student let goes off the trigger. The organizer provides the track with specifications shown in **figure 1**.
4. The track will contain fences on each side made of wood, 5cm thick and 5cm high.
5. All material used in the systems must be safe, harmless, and accessible to everyone in the normal market. Systems should need no safety protection and **no grid electricity**
6. Teams with electronic components **are not permissible and will be disqualified.**
7. In addition to the competition round, each team will be given 5 minutes to demonstrate all aspects of their system.
8. Each car dimensions are limited to 30 cm width (Max), 30 cm length (Max) and 30 cm height (Max). Cars exceeding the parameters will be disqualified.

9. Each system will be assessed based on;

| Name | Description | Points |
|--------------------------|--|--|
| Round 1 (Figure 1) | Finishing the 3 meter long track in the least amount of time | Score= (Time of this Round)/(Fastest time of this Round)*25 points |
| Round 2 (Figure 2) | The car being able to carry 1 kg as well as finishing the 3 meters in the least amount of time | Score= (Time of this Round)/(Fastest time of this Round)*25 points |
| Round 3 (Figure 3) | The car being able to carry 2 kg as well as finishing the 3 meters In the least amount of time | Score= (Time of this Round)/(Fastest time of this Round)*25 points |
| Gearing Mechanism | The gearing systems within the car the will move the car with speed and efficiently | 10 points |
| 3D printing | Parts of the gearing system or the car must incorporate 3D printing | 10 points |
| Innovation in the design | In this criterion, the judges will look for innovative, efficient designs and the team members' ability to explain their system's operation. | 5 points |

1. Students must use gearing systems. Students are allowed to update/modify the gearing system before each round. The use of a new system or a new car/ driver is **NOT ALLOWED**.
2. Students can continue competing for all three rounds if they cannot finish any round.
3. **Ready-made cars are not allowed. However, students can use gearing kits/wood/plastics/metal structures or similar available on the market.**
4. In the case of 3D printing utilization, students have to demonstrate and provide evidence of the design steps.

CRITERIA FOR JUDGING GAMES:

ROUND 1 (20 points):

In this round, the car with a built-in gearing systems will be tested on how fast the car can go.

1. The car will be placed at the starting line. Student will let go of the trigger. The trigger might be a push button, stick, or releasing mechanism.

2. The car will move along a 3 meter long track
3. The car has to finish the track as fast as it can
4. The time will be recorded and compared to the rest of the teams
5. It is valid If the car hits the fence and still can complete the race.
6. It is a zero score If the car stops in the middle and is not able to continue the round

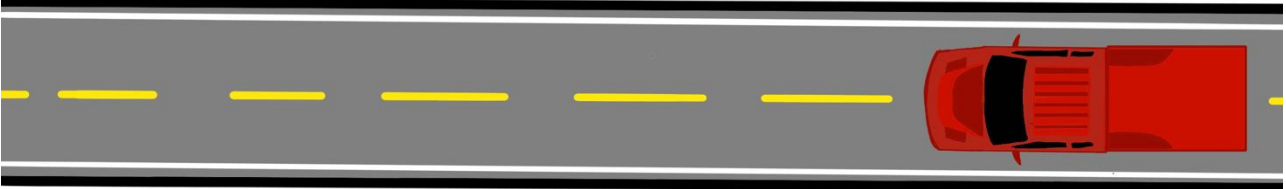


Figure 1. 3m track

Innovation and Mechanical Design: In this criterion, the judges will be looking for innovative, efficient designs and for the ability of the team members to explain the operation of their system.

ROUND 2:

The car will be tested by carrying a load of 1kg while moving along 3-meter track as fast as it can:

1. The students are allowed to change or modify their gearing systems only before the start of the round.
2. The team with the car that finishes the 3-meter track while carrying 1kg load in the least amount of time will win

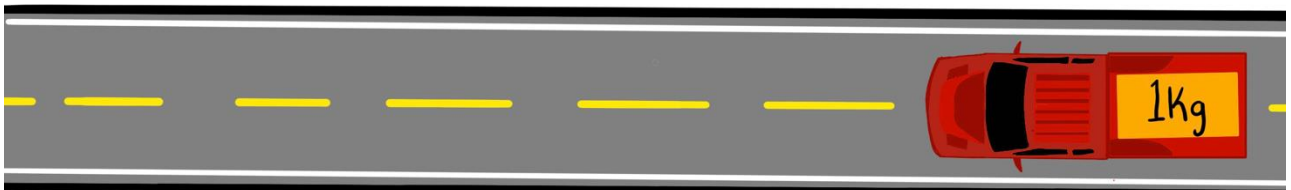


Figure 2. The 3 meter long track with the load of 1 kg

ROUND 3:

In this round, the car will be tested by carrying a load of 2kg while moving along 3-meter track as fast as it can:

1. The students are allowed to change or modify their gearing systems only before the start of the round.
2. The team with the car that finishes the 3-meter track while carrying 2kg load in the least amount of time will win

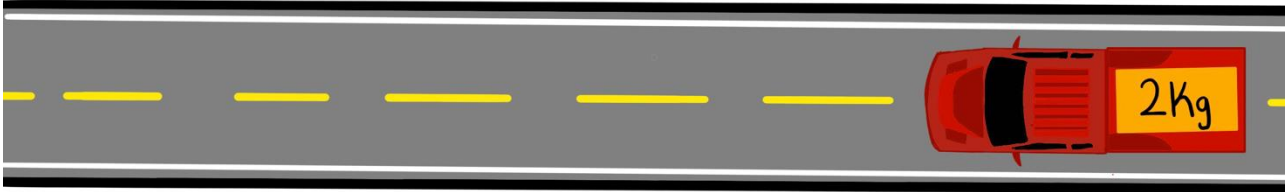


Figure 3. The 3 meter long track with the load of 2kg

[For Further details or questions please contact](#)

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