AXELERATE'20


BACK TO THE FUTURE

"For an understanding of the future, look to the past".

Your ability to envision the future is strongly influenced by your memory of the past. Past techniques inspire advancements in technology in the automobile industry for transpire future. Stimulating from the basic knowledge of fuel-based remote control engineers could develop a more advanced and improved version of the model, which can inspire for the development of the industry. This year get lost in the past for advancing the future.

TASK

Fabricate a radio control wireless fuel based car which must be capable of performing basic stunts and which can race against the competitors on a mud track full of obstacles.

RULES

Arena: There will be an **all-terrain track**, a fusion of muddy dirt-tracks and gravel bumps. The car must be ready to face rough patches and unique obstacles while throttling through the opponents maintaining its pace and control.

- The width of the track will vary from **1 m to 2 m** along the path.
- A ***ramp*** will be provided on the track for driver to control his vehicle during the run. The height of the stand will be around **8 ft**. The controlling of machine has to be done from this stand only.
- Despite organizer's efforts to keep the track's quality intact, it is subjected to undergo wear and tear as cars run over it. The car is expected to be able to run on such a weakened track as well.
- Multiple machines will race, in some of the rounds, on a single lane track at a time.
- A lap of the track is completed when the machine comes back to the start-finish line.

Evaluation

Round 1 - In this round, teams will be ranked based on the points gathered from both, lap-time elapsed and obstacles crossed in a lap. *Best of two laps shall be considered.*

Round 2 - In this round, points will be given based on the ***hurdles you clear in 2 minutes*** and additional bonus for every lap completion. Each hurdle will carry different points based on its difficulty level. You can skip a hurdle after *at least* two failed attempts for no points. Fixtures for the next round will be based on this round's results.

Round 3 - 8 teams will qualify for this round. In this round, ***two teams will race*** and the winner will qualify for the final round.

Wild Card Entry Round - A special entry pass based on a surprise round for Round 3 eliminated participants.

Round 4 - The top 4 teams will face each in an ***elimination race***. The race will be of 3 laps and the team at last position after each lap will be eliminated.

The organisers reserve the rights to modify the above rounds.

There will be some special rounds and that will consist prize money as well these special rounds will include "Best lap time", "Best hurdle point" and many more which will be disclosed at the time of event.

EVENT STRUCTURE

HURDLES

The Track Will Consist Of Following Hurdles:

- **Sine Wave** - A sine wave shaped hurdle of total length 2m, the height between the extreme levels being 0.3m.
- **Wedge** - Wedges of up to 60 degrees inclination.
- **Banking** - Banking will be provided on the track for some sharp turns.
- **Narrow Pass** - Track width can be reduced.
- **Speed Breakers -** Speed breakers will be there on the track.
- **Vision blocker -** Obstacles to obscure the vision of the driver will be present on the track.
- **Segmented bridge -** A narrow elevated path to test the stability and control of the car.

Apart from these, some surprise hurdles will also be included on the track

MACHINE SPECIFICATIONS

BODY

Machine should fit in a box of dimensions **800mm x 400mm x 600mm (L** X **B** X **H)** at any moment of time during the race. The external device which is used to control the machine is not included in the size constraint.

ENGINE

Maximum piston displacement allowed is **4.2cc**. There is no restriction on the type of IC engine (either glow or diesel cycle engine), but the engine must have throttle control. Only one IC engine should be used in the machine. Use of any other sources such as DC motors, chemicals, compressed gas, rockets etc. for propulsion is not allowed.

FUEL

The fuel should only have these constituents: methanol, castor oil/synthetic oil, nitro methane. The percentage of *nitro methane* should *not exceed 20% by volume* in the fuel. At most one filter can be used in the fuel line.

POWER SUPPLY

The machine must have an on-board power supply to provide power to any mechanism requiring electric power. The maximum potential difference across any two points in the vehicle should *not exceed 12volts*.

RADIO CONTROL

The teams will have to control three components of the car viz. Engine throttle, Steering and Brake system. The machine has to be necessarily controlled by a *wireless remote control system.*

CONTROLLING

DC motors and servos can be used for steering mechanisms or any other control mechanisms apart from propulsion.

OTHER RULES

The components of the machine can be broadly divided into two categories:

FUNCTIONAL PARTS:

Gears, differential gear, engine, springs, shock absorbers, servo motors (non-propulsion purposes only), batteries, wheels and wheel hubs; these parts can be purchased directly from the market.

STRUCTURAL PARTS:

Chassis, drive shaft, steering mechanism, shock towers. At least 3 structural parts must be fabricated manually otherwise a **penalty** will be imposed. Coordinators decision will be final regarding this.

GENERAL RULES

- If a machine tumbles, halts or goes off the arena at any point on the track, one of the team members is allowed to lift it up and place it at the previous checkpoint from that point. Meanwhile, time shall be running.
- In rounds 1 and 2, a maximum of two team members are allowed from a team in the racing arena while in the 3rd round only one of the team member will be in the racing arena except the controller on the stand.
- No time shall be provided to repair the damaged parts.
- If any of the machines starts off before the flag is waved, the counter would be restarted and the machines will get a second chance. However, on repetition of same that team will be disqualified. No rematch will be held for the second time.
- Certificate of Participation will only be awarded to those teams that complete the technical round and preliminary racing round.
- Abstract submission is compulsory for each team.
- It's compulsory for every team to report at the registration desk on the day 1 of the event.
- If any of the above specifications are not fulfilled, points will be deduced or disqualification may be imposed at the sole discretion of the organizers and technical heads. No disputes would be entertained. The decision of the Technical Heads is final and binding.

The organizers reserve the rights to modify the above rules. Any change in rules will be highlighted on AXELERATE's event page on Technex'19 website.

TEAM SPECIFICATION

- All students with a valid identity card of their respective educational institutes are eligible to participate in Axelerate at Technex 2019.
- A team may consist of minimum 2 and maximum of 5 members. Students from different educational institutes may form a team.

SUBMISSION OF ABSTRACT

- **The abstract should contain a brief description of your radio control wireless fuel based car. Consisting details of:**
  - The steering mechanism, suspension mechanism, braking mechanism
  - Engine, fuel, radio, battery specification, chassis, servo system
  - Attach photographs of structural parts fabricated by the participants themselves and assembled car.
  - Description of any unique/ advantageous mechanism used.
- The abstract must contain full details of all the members of the participating team with **team leader's name highlighted**.
- The following details should be provided of all team members along with

  The Team name:

  Name: City: Branch:

  E-mail: Institute Name: Contact No.:
- The confirmation of acceptance of the abstract will be informed via email to the team leader.
- The abstract should be submitted by the team leader in the PDF format only.

Abstract submissions should be made in the given Google Form before the deadline: 1st Feb 2020

https://forms.gle/7B3kw8mQW3c74ZyV8

QUERIES

In case of any doubts, participating team are requested to kindly contact the organizers for registration and other details kindly visit – https://www.technex.in/

You may contact:

Ratnesh Kumar	**8601066147**
Rupendra Saran	**9460144668**
Yogesh Bhadrecha	**9565574230**
Kunal Allewar	**9420283110**
Vaibhav Chauhan	**7895411167**