

## INTERNATIONAL FULL THROTTLE

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*VERSION 1.0 (September 28)*

## TASK

*Design an RC Nitro Buggy which can race against other opponents on an off-road dirt track*

## DESIGN SPECIFICATIONS

### Radio Equipment

- Changing frequencies by interchanging transmitter and receiver crystals (“reversed frequencies”) is prohibited.
- Radio Systems are limited to the use of two channels for operating two servos.
- **2.4GHz** DSM/DSS systems or any frequency are allowed but should notify the transmission technology, crystal frequency to Techfest.
- No advancement in radio apart from bot controlling/regulating/fine tuning/trimming will be entertained.

### Brakes and Clutch Specifications

- Vehicle batteries must be securely mounted
- All fuel-powered vehicles must be equipped with a working brake system capable of stopping the vehicle and holding it motionless with the engine running.
- All vehicles must be equipped with a working de-clutching device capable of allowing the vehicle to stand stationary with the engine running.
- Any event official may check engines, fuel tank capacities, carburetors, and other specifications at any time.

### Exhaust Rules

- All vehicles are required to use a muffler or tuned pipe through which the exhaust gas must pass.
- Fuel tanks must be securely mounted.
- Maximum fuel system capacities is 125cc with 4.6cc maximum engine capacity.

### Engine Specifications

- Only single-cylinder, two-stroke, normally aspirated, air-cooled, glow-ignition engines utilizing standard or turbo plugs will be permitted.
- No forced aspiration systems like liquid cooling systems or fuel pressurization systems (other than by means of exhaust pressure applied directly to the vehicle’s fuel tank) are allowed.
- Any carburetor may be used as long as the bore does not exceed the maximum allowable for the engine size.
- Restrictors may be used to achieve the legal diameter, but must be securely fastened in place.

## Dimensional Specifications

Item	Limit	Specification
Length (B)	Maximum	730 mm
Width	Maximum	310 mm
Height (measure with suspension fully compressed)	Maximum	250 mm

## Tires (Rubber only)

- No tires created for other vehicle types, even if they meet the specifications, will be allowed.
- Cutting or modifying the tread is allowed.
- Trimming the mounting bead of a tire in order to fit a legal rim is allowed.
- Cutting tires from same class to fit wheels of same is not allowed, regardless of whether it fits minimum tire dimensions or not.
- Cutting tires from one class to another class is not allowed regardless of dimensions.

## Note:

1. All tire measurements reference the carcass dimensions and do not include the tread depth or width.
2. Engine size: 0.21oz or 0.28oz Open

## Transmission and drive

- Single speed transmissions only
- 2WD (two-wheel drive) or 4WD
- Rear suspension: Independent.
- Body Style: Buggy or other off-road style body that resembles an actual off-road racing type vehicle.
- All the specification will be verified by Techfest. Also Techfest will not be responsible for any unavoidable disqualification due to behavioral or technical ambiguity.

## Fuel Rules

- 25% Nitro methane is the maximum allowed (in terms of %) fuel type.
- Any fuel composition in any ratio apart from nitro might be entertained but only with prior notice.

## Radio/servo rules

- No traction control system, only steering servo and throttle servo will be operated by radio, any miss lead will lead to disqualification and will have to pay a penalty of destruction.
- Vehicles should have a fail-safe system that will positively return the vehicle's throttle to an idle position if the vehicle loses electrical power or its radio signal

## COMPETITION DETAILS

### Team Specifications

- Any team can participate in International Full Throttle conducted by Techfest, IIT Bombay. A team may consist of a maximum of 4 participants. These participants can be from the same or different institutes.
- Team Representative: Each team must specify their team representative (leader) at the time of registration on website. All the important communications between Techfest and the registered teams will be done through their team representative. The team representative must submit valid contact details (phone number, email ID, etc.) at the time of registration.

### Registration

- Last date for Abstract Submission and Registration is **29th October, 2018**
- Since there might be updates to the Problem Statement (see the closing section "Important Note"), Techfest organizers will make sure that the registrants are informed about any updates through email/SMS.

### Submission of Abstract

Participants have to submit a portfolio of their car, consisting of various details and a video of the working model before the competition. This portfolio will be used to seed teams for the competition. Only the shortlisted teams will be eligible for "Full Throttle" at Techfest 2018-19. The teams are required to submit all the details in the mentioned Google Form along with the link for the video of your car. Any other submissions won't be entertained. Last date for portfolio submission is **29th October, 2018**.

### Details regarding the abstract:

*Written Abstract (Google Form):*

- All the team have to fill the mentioned form before **29th October, 2018, 11:59 pm**.
- The form will consist of engine details, fuel details, radio details, battery specification, car chassis details, tires, servo system, etc.
- The form will be used for better understanding of the drivers technical product, identification of the car/model/device/products going into the individuals cars/system, to monitor all the Engine rules, fuel rules or miscellaneous rules.
- Link for the form: [Abstract Submission Form](#)
- If any team, wants to change any of the filled details or want to add few more features to the car, can write us a mail at [full\\_throttle@techfest.org](mailto:full_throttle@techfest.org) before **26th November, 2018** with subject: "International Full Throttle: Car Specification Form"

#### *Video Abstract:*

- The video should be of at least 1 minute with the unedited clip showing the car performance to the fullest. We may demand another clip at a later stage from the participants who qualify this round. Instructions for the same will be mailed to team leader of the team. Last date for submission for the first video is **29th October** along with the Form (you have to add the link for the video in the form).
- Participants are not required to explain the mechanism in the video. All the portfolios will be used strictly for seeding purposes.

**All the submissions should be made in the Google Form before the deadline.**

**NOTE:** Please note that this video abstract will not be the sole criteria for selection of your team to perform at Full Throttle, Techfest 2018-19. Judges will go very thoroughly over the video and written abstracts and then shortlist the teams which would be allowed to perform in the competition. The portfolio is meant to assess the efforts put in by the participants. Thus, even if you are not able to meet the requirements asked in the portfolio, please fill the form with other specifications before the deadline. That is, even if your car is not ready, please send the portfolios anyway, instead of not sending them or sending them late.

#### **Certificate Policy**

- Certificate of Excellence will be given to top 3 teams of both the national and international round (if a team is in top 3 of both the rounds, then only one certificate will be given for international round)
- E-certificate of Participation will be given to Top 60% teams (except top 3 winners).
- Teams which will get disqualified due to disobeying any of the competition rules will not be considered for the certificate.

#### **Prizes**

- Prize money will be awarded for Top 3 winners of National Round (particulars mentioned below in the third point)
- The Top 3 winners of International Full Throttle will be given a Trophy.
- Prizes worth INR 1,20,000 consists of prizes for best designs, engineering, skills, reimbursement for selected teams outside Indian subcontinent and other subjective criterion (subject to discretion of judges), in ratio 1:1 for other prizes to selected (outside Indian subcontinent) team reimbursements.

The Prize money will be awarded via NEFT and will be processed within 30 days after receiving the prize money from sponsors. The Winners will have to mail the following information (immediately after announcement of results) to [rohan@techfest.org](mailto:rohan@techfest.org), strictly in the following format

1. Subject: International Full Throttle, Team ID- your position (example- International Full Throttle, FT1003- 3<sup>rd</sup> Position)
2. Body of mail:
  - a. Account Holder's Name
  - b. Account Number
  - c. Bank name and Branch name
  - d. IFSC Code

## COMPETITION STRUCTURE AND RULES

### National Round

- The race will be conducted during 14th-16th December, 2018 with 14th December as Day 1, 15th December as Day 2 and 16th December as Day 3.
- Registrations and verification of the car will start in the morning of Day 1. All the teams must report at the time provided (will be updated soon). The teams will be given their slot for qualifying heats accordingly (mentioned in the further sections)
- National Round will be conducted on Day 2, Top positions of National Round will be qualified for International Full Throttle which will be conducted on Day 2 and Day 3.
- Practice slots will be given to all the national drivers in the second half of Day 1.
- 2 Qualifying heats, Q1 and Q2, will be conducted in the first half of Day 2. The teams which will secure top positions in National Round will qualify for International Full Throttle on Day 3.

### Qualifying Heats

- Each qualifying heat will have 'n' slots of 'x' duration each. There will be 'd' drivers in each slot (*values of 'd', 'x' and 'n' will vary with respect to number of teams selected by Techfest*)
- A race will be conducted in each slot amongst 'd' drivers. The number of laps will be mentioned on the spot but will be less than 4.
- Positions of drivers will be displayed after each qualifying heat and selected teams will qualify for next heat/further rounds.
- All teams must be present near the track in their slot. If any team will not be present at the assigned time, then that team will be disqualified

**International Full Throttle**

- Practice slots will be given to all the selected national and international teams in the second half of Day 2
- 2 Qualifying heats, Q1 and Q2, will be conducted in the first half of Day 3.
- The Final Race will be conducted in the second half of Day 3.

**Grand Finale**

- Top 10 positions on the scoreboard calculated after 2 qualifying heats will qualify for finale
- The winner of first race F1 consisting of 10 teams will secure 1st position
- The next race F2 will constitute of 9 teams excluding the winner of previous race. The winner of this race will secure second position.
- The next race F3 will constitute of 8 teams excluding the winner of previous race. The winner of this race will secure third position.

**PIT lane rules**

- All drivers entering Pit lane should be cautious of the in-front buggy, any intentional dashing will lead to a driver penalty or even disqualification of the driver
- No over speeding in the pit lane will be entertained by the judges.
- The refilling system should be as simple as a fuel gun or a fuel bottle.
- No nitro should be over filled resulting into spilling all over the pit lane. Spilling of fuel over the pit lane will lead into penalization of “drive through pit on announcement” and if not done so will result into the time penalty of 5+ seconds.
- All driver should be accompanied with the Pit Crew if not so do talk with the organizer who will try and make available the same. “PIT CREW” is a pit refilling person.
- There will be exactly one Pit Crew for every team in the pit lane.
- A nitro buggy can enter pit lane any number of time but if found any forgery will lead to a penalty of 10+sec and will be added to the final circuit time.

**Driver Stand**

- All drivers while racing will be accommodated in the driver stand which will be spacious but it is the drivers responsibility to hold straight and be co-operative with the neighboring drivers.
- Any misleading activity/sledging/abusive language once reported will lead to driver penalty and will not be recognized by the organizer for International Full Throttle.

Execution of some of the PIT lane and Driver stand rules will be subjective and relies completely on judges' and organizers' discretion.



## General Rules

- The machines are not allowed to leave any loose parts on any part of the arena. Any machine disintegrating during the race will be disqualified.
- 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, if any machine starts off before the waving of flag (or countdown) for a second time, it will be disqualified. No rematch will be held for the second time.
- **In case of any disputes/discrepancies, the organizers' and judges' decision will be final and binding.**

## EVENT TIMELINE

Last Date for Registration	29th October 11:59 pm
Last Date for Abstract Submission	29th October 11:59 pm
Last Date for mailing changes in Car	26th November 11:59 pm
Registrations and Verifications of Car	First Half: 14th December
Practice Session for National Round	Second Half: 14th December
Qualifying Heat: Q1 and Q2	First Half: 15th December
Practice Session for International Round	Second Half: 15th December
Qualifying Heat: Q1 and Q2	First Half: 16th December
Grand Finale: F1, F2 and F3	Second Half: 16th December
Prize Distribution Ceremony	Evening: 16th December

## TRACK SPECIFICATIONS

- The track will be an off-road dirt track
- Outer dimensions of the total racing track will be **110ft x 70ft** (l x b).
- The width of the track will be around **8 feet** for most of the part.
- Exact arena design will not be disclosed before December.
- Pit lane along with Drivers stand will be provided on one side of the track
- Multiple machines will race, in some or all 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.
- Despite organizer's efforts to keep the track's quality intact, the track is subjected to undergo wear and tear as cars run over it. The car is expected to be able to perform on such a weakened track as well.



**AN IMPORTANT NOTE:**

These rules may change any time, even without explicit notification to teams. However, the document uploaded here is to be followed as the latest problem statement for all the rules and design specifications. Any change can be observed in the name of the document which will contain a higher version (v2.0, say) if updated. The teams acknowledge that they have the responsibility to read, understand and abide by the rules and Techfest, IIT Bombay reserves the right to prevent any team from competing at any time for any reason (including but not limited to the reasons specified elsewhere in this document). However, we shall inform all the registrants in case an updated version comes up (all the registrant till date of revision). In case of any queries, participants are encouraged to contact Techfest, IIT Bombay.