



# **AUTO INDIA RACING CHAMPIONSHIP**

*.....journey starts with passion.....*

*{AIRC}*

**2020**

**SEASON -4**





# Message from Founder

Dear Students,  
Greetings from the AIRC Team

Last year we started a journey to revolutionize the learning methodology with the motto “**journey begins with passion**”, encouraging technical skills of the under-graduate and graduate students. Today we can say that WE ARE providing one of the best platforms across the nation for the TECHNICAL students to show their best technical skills of designing, manufacturing and coagulating with team to work for betterment.

With the accomplishment of First season we are glad to say, that we were able to give the best racing track and technical and non-technical support to the teams in the event and also have provided the job placements opportunity for the students through the event. People come up from all parts of the country from Karnataka, Rajasthan, Madha-Pradesh, Kerala, Gujarat, and Uttar Pradesh, Odisha and other state, to just be a part of this Event. We designed the Event in such a way that it compels you to think out of the box and this is the beauty of our Event.

For the next Journey we wish to make it much better in the coming couple of years. We wish to take it on a Global scale and make this industry oriented, so that we can bridge the gap between students and industries.

As the Founder of this Event, I look forward for a long standing association of learning, trust and synergy with you and Welcome you to experience the rich culture of Go Kart Series.

Mr. Manoj Bhojane

President

# About Event

Auto India Racing Championship 2019-20 is a GO-KART racing event, where under graduate and graduate students are given opportunity to design and fabricate their four wheeled vehicle. This event is an intercollegiate design competition for engineering students. The vehicle must be highly engineered, safe and ergonomically designed.

The purpose of the event is to provide an opportunity for engineering students to develop their skills and also their stepping stone in automobile sector in India and come up with some innovative designs. Students have to tackle real world engineering problems, work in multidisciplinary teams, practice design for manufacturability and manage a full product development cycle of life.

The Competition includes designing, fabricating and validating a four wheeled vehicle driven by one driver. The vehicle would be capable to be driven by one driver on gasoline. The vehicle would be evaluated for its design, performance, safety, durability and the teams compete against each other. The cumulative scores of all the events would decide the overall ranking of the teams in the event.

# 1. Eligibility

## a. Student Status

Team members should be undergraduate or graduate students in a college or university of age 18 years or above. Team members who have graduated during the nine (9) month period prior to the last date of competition remain eligible to participate. The student must have the following.

1. I.D Card
2. Bonified Certificate
3. Driving License (For Drivers)
4. Indemnity Bond
5. Medical Insurance (For Drivers)

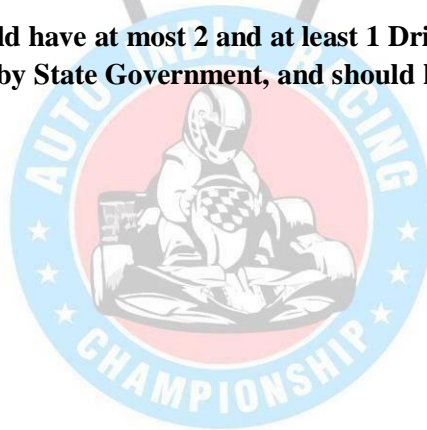
Maximum No Member – 25

**Note: - If the team is having all girls member in the team than the team would be given Rs. 500/- discount per girl member of the team.**

## a. Additional Requirement

Each team is supposed to have a Faculty Advisor appointed by the college/university. The Faculty Advisor is required to accompany the team to the competition and will be considered by competition officials as the official college/university representative.

**The Team should have at most 2 and at least 1 Driver , who should have a valid Driving License issued by State Government, and should have an insurance cover of at least the Event days**



# 3. Vehicle Requirement

## a. Vehicle Configuration

The vehicle must have four (4) wheels and wheels should not be in a straight line. The vehicle must be capable of carrying one (1) person 190cm (75 in) tall weighing 113kg (250lbs).

## b. Vehicle Dimensions

Wheel Base- 40 inches minimum

To 55 inches maximum.

Track Width-

70 to 80 % of wheel base.

Weight- no restriction (keep minimum as possible)

## c. Frame Material & Cross Section Requirements

The bending strength & bending stiffness of the cross section used in frame must not be less than bending strength & bending stiffness

## d. Material Testing Report

A material testing report will be required at the time of event, in which material compositions and strengths etc should be clearly mentioned.

Teams may use external laboratory for material testing. Material strength testing may also be done in the institute's facility and an in-house validated report should be presented. The proof of in-house testing should be kept in form of photos, videos captured during strength testing. The certificate provided by material dealers will not be accepted.

## e. Driver Seat

Every team has to use proper Go karting Seat. The driver seat should be well cushioned and at least 3 inches away from the firewall. The seat must support the thigh and the entire torso (full width) of the driver

## f. Bumpers (Front & Rear)

Must be installed in the front and rear of the vehicle such that they cover the tyres and protect them from any collision which may occur on the track. They must be made of steel tubes. Minimum OD 1 inch (25.4mm) and minimum wall thickness 1.65mm. Bumpers must have proper accessibility for use as towing point or where temporary rope or harness can be tied for towing purpose.

## g. Visibility Requirement

The engine compartment must be completely visible to examiners.

## **h. Fuel Tank and Its Position**

The placement of fuel tank should be such that it maintains a proper distance from the engine and also it should not be above the battery. It must be securely fixed to the chassis and be designed in such a way that neither it nor the fuel pipes (which must be flexible) present any danger of leakage during the event. A quick attachment to the chassis is strongly recommended.

## **i. Front Bodywork**

The bodywork of the front part must be designed such that the vehicle number and the team logo may be displayed clearly. If the front body work is provided; the driver egress should be less than 5 seconds.

## **j. Seat Belts-Prohibited**

Strictly Prohibited

## **k. Clearances**

- **Body Clearances**

There should be a clearance (gap) of minimum 3 inches (76.2mm) between the driver and any component of the vehicle, in static and dynamic conditions

- **Ground Clearances**

With the driver aboard there must be a minimum of 25.4 mm (1 in) of static ground clearance measured from the lowest point (except tyres) of the vehicle, under the complete vehicle.

## **l. Engine**

- **Powerhouse**

The engine you can use till 150cc any of the bike. The engine in use should have all legal documents and the number will be checked on the engine. If any team is caught doing malfunction practice regarding engine they will be disqualified.

**There will be equipment to check the settings of the governor at the main event.**

## **m. Exhaust**

The teams have permission to do changes with the exhaust system of the engine. The Exhaust must be will protected with insulation.

**NOTE- SMOKE FROM ENGINE, EXHAUST, BATTERY OR ANY OTHER PART OF VEHICAL WILL NOT BE ALLOWED DURING THE STATIC OR DYNAMIC EVENT.**

## **n. Transmission**

Teams have flexibility to use any kind of transmission for the vehicle motion. Care should be taken that all the transmission parts are covered by sheets which can withstand the vibrations of the moving parts.

## **o. Brakes**

The brake system installed must be capable of stopping the vehicle in a straight line without losing control during the brake test (minimum speed must not be less than 40 kmph in the brake test). Electronic braking systems are strictly prohibited. In case of brake mechanism bleeding ports for disc caliper should be upside to that of piston mechanism of caliper. There should be no leakage from the tandem master cylinder (TMC) or reservoir.

## **p. Wheels & Tyres**

Teams must use standard go-karting tyres. Acceptable tyre size for front is 10x4.5-5(all dimensions in inches) and for rear tyre 11x7.1-5.

## **q. Firewall**

Firewall should be made in such a manner that driver's body parts are not affected by the engine heat at any time during the dynamic/static condition. There should be min 2 inches clearance between the firewall and the engine.

## **r. Steering Control**

The steering system must have positive steering stops from locking up either in RH or LH turning. The stops prevent the tires from contacting suspension, body, or frame members during the track events. Allowable total steering system free play is limited to 7 degrees, measured at the steering wheel. Steer- by-wire or electronic steering is prohibited.

## **s. Push Bar**

Off track vehicles must be pushed at a normal walking pace by means of a "Push Bar"

## **t. Floor Tray/Belly Pan**

The cockpit must be fitted with a belly pan over the entire length of the cockpit, so that the driver cannot contact the ground and is protected from debris while seated normally. Belly pan material must be metal, fiberglass, plastic, or similar material.



## **u. Fasteners**

All fasteners used in the systems must be captive; defined as requiring NYLON locknuts, cotter nuts or safety wired bolts (in blind applications).

All bolts used in the system must meet SAE grade 5 or metric grade M8.8. All threaded fasteners used in the vehicle must have at least 2 threads showing past the nut.



## 4. Electrical Requirements

### a. Kill Switches

The electrical system must include at least two kill switches. The kill switches must deactivate the engine ignition. The kill switch must not deactivate the brake light.

- a) The cockpit switch must be located in the cockpit within the easy reach of the driver.
- b) The external switch must be mounted on the driver's right side of the vehicle the switch must be within easy reach of track workers, the switch must be mounted rigidly, with no sharp edges nearby.

### b. Wires & Harness

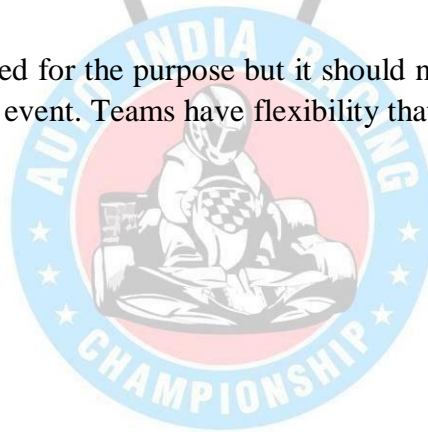
Selection of wire diameter/cross-section must be done according to the current in the circuit. All wires and harnesses must be fastened securely to the vehicle structure that prevents coming off in static and dynamic conditions.

### c. Brake Light and Light

The vehicle must be installed with a brake light red in color which is clearly visible from the rear. Head lights must be there for night racing.

### d. Battery

Any kind of battery can be used for the purpose but it should not cause harm to team mates any other individual at the time of event. Teams have flexibility that how much battery pack they are using. Motors are not allowed.



# 5. Safety Requirement

## a. Driver's Equipment

The following are the minimum requirements and restrictions that will be enforced through technical inspection, at any stage of competition.

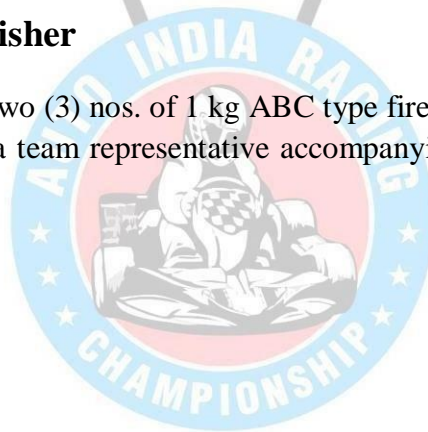
- **Driving Suit:** - A fire resistant one piece suit, made from a minimum of 1-layer that covers the body from the neck down to the ankles and the wrists.
- **Underclothing:** It is strongly recommended that all drivers wear fire resistant underclothing (long pants and long sleeve t-shirt) under their approved driving suit.

**Note:** If you do not wear fire resistant underclothing, it is strongly recommended that you wear cotton underclothing (t-shirt and long underpants) under your approved driving suit.

- **Helmet:** A well-fitting closed face certified helmet that meets certifications
- **Neck Support:** The use of neck support is mandatory.
- **Gloves:** Leather gloves with extra foam are acceptable.
- **Shoes:** Fire resistant shoes made from acceptable fire resistant material, shoes must be certified to the standard and labeled as such.

## b. Fire Extinguisher

Each team must have at least two (3) nos. of 1 kg ABC type fire extinguishers. One present at the pit at all times and one with a team representative accompanying the kart throughout the event and one mounted on the kart.



# 6. Event & Procedures

## Main Event

There will be following categories of events:

- 1) Technical Inspection a.  
Rulebook/Safety Check c.  
Electric Inspection  
d. Brake Test  
e. Weight Measurement

- 2) Static Events  
a. Design Evaluation  
b. Cost Evaluation  
c. Go-NoGo Test

- 3) Dynamic Events  
a. Acceleration  
Test b. Auto Cross  
c. Skid-Pad  
d. Endurance Run  
e. Night Racing



# 7. Event Format

## a. Sub-Event

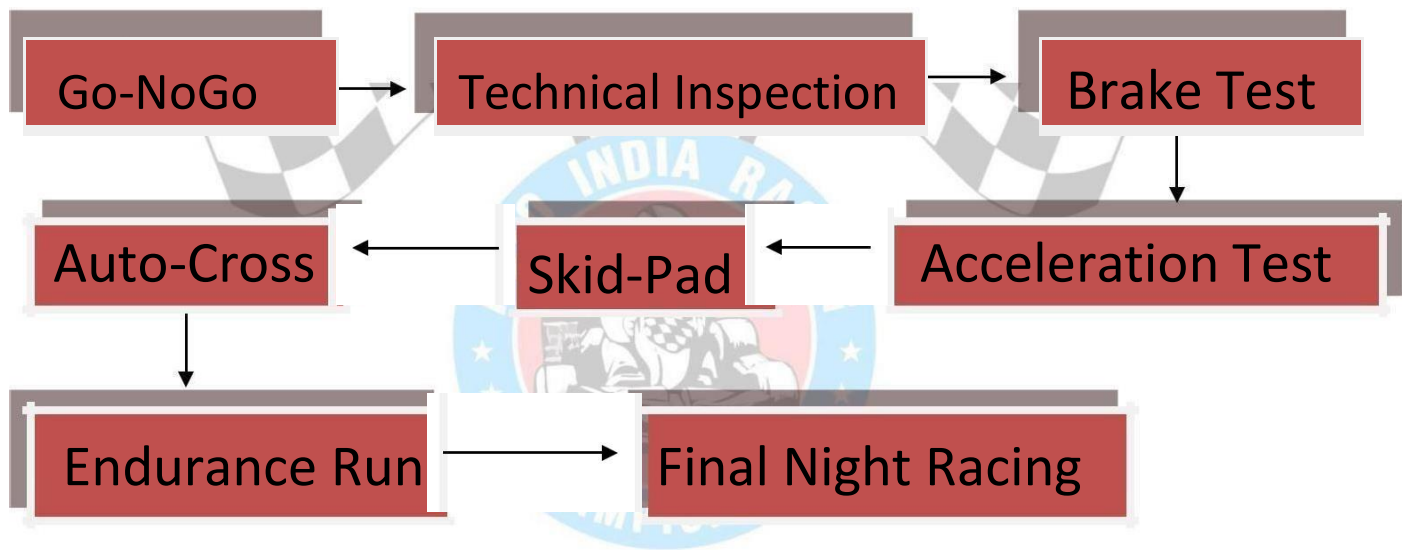
There would be only one Sub-Event before the main event and that would be online design report submission.

In this the Team has to submit the following reports-

1. Design report
2. CAE Report
3. Kart's Photos (Front, Rare, Side And Top Views)

The Team has to mail all the reports and documents to [autoindiaracing@gmail.com](mailto:autoindiaracing@gmail.com) e-mail address through the e-mail address having team name mentioned in the e-mail address, mail all documents and keep all photos in a .pdf format with the name as team name.

## b. Main-Event



### i. Go-NoGo

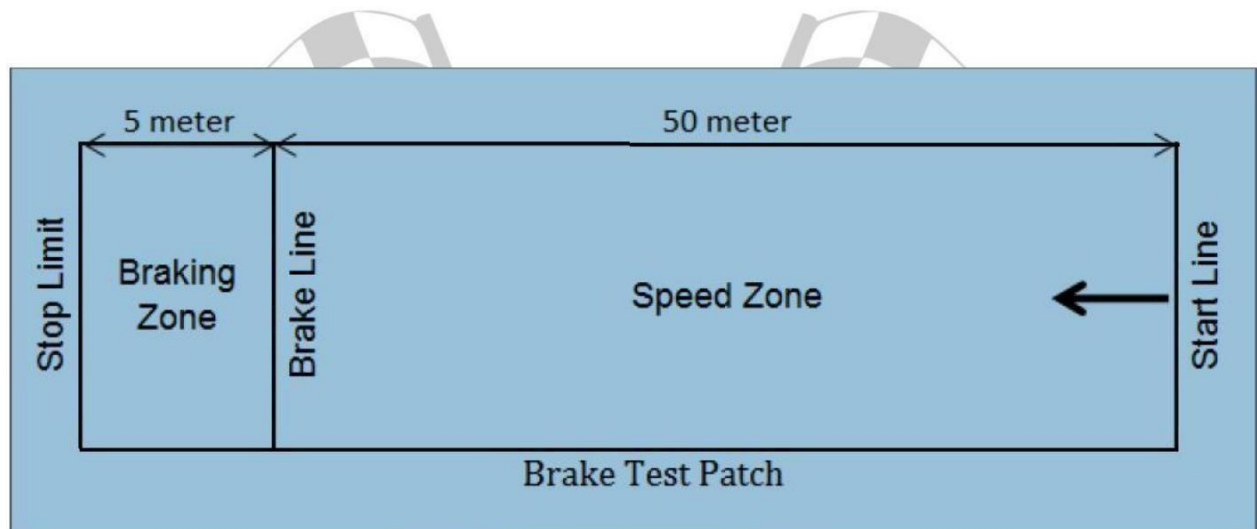
This is a static event in which the kart passes between the two poles of 60 inches for checking the track width of front and rare part of the kart the outer most member would be consider for the measurement of the width.

## ii. Technical Inspection

Some Standards have been set in the technical inspection sheet. Every team has to fulfill each and every Standard, failing to which the team may be disqualified. Before coming for the event make sure you fulfill all the requirements mentioned in the technical Inspection Sheet. 2 Attempts of Clearing the T.I would be given for one team. During it the team has to bring their design, CAE and cost report as the design and cost evaluation would be done during TI itself.

## iii. Brake Test

The vehicle should run on a desired speed (say 40km/hr) on a straight track. Two consecutive Lines would be made at a distance of 50m. The vehicle has to cross the second line within a desired time (say 8 seconds) and just after crossing the second line is allowed to apply brake (The Vehicle cannot decelerate in between the lines of the Runway). The vehicle in any condition should stop before the Last Line. 3 attempts to clear this Test would be given for a Team.

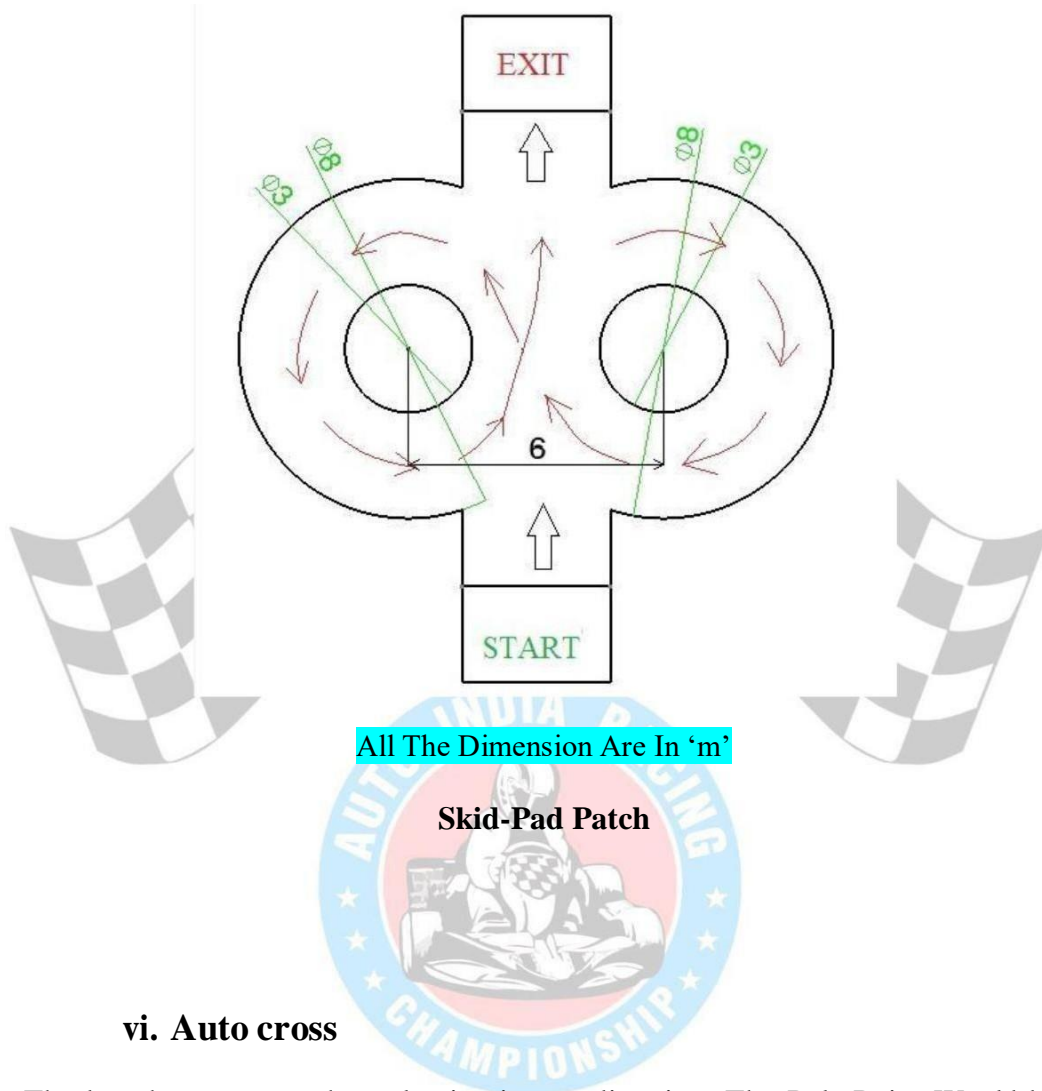


## iv. Acceleration Test

The vehicle acceleration abilities would be tested in this event. There would be two lines 50m apart on a straight Track. The vehicle has to cross the Second line in minimum time. Time would be started just after the front wheel crosses the start line. 1 attempt would be given to a team.

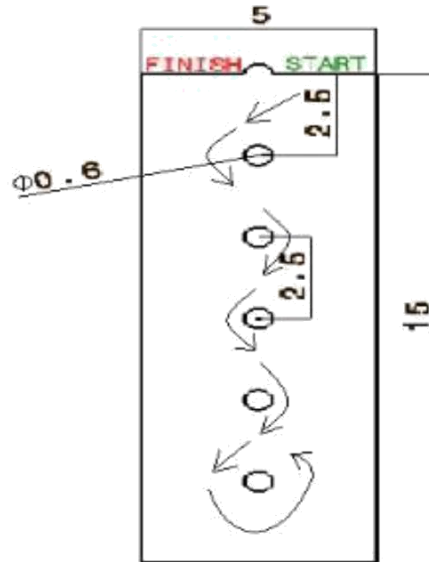
## v. Skid Pad

The kart has to draw the figure of '8' in this dynamic event. The kart has to start with the right turn and would have to complete two lap (of figure 8) for every attempt of Skid-Pad.



## vi. Auto cross

The kart has to cross the poles in zig-zag direction. The Pole Point Would be at 2.5m from each other there would be total 6 pole the first pole would be kept at the start line and the crossing would be counted from the start between first and second pole.



All The Dimension Are In 'm'

### Auto Cross Patch

#### vii. Endurance/Night racing

The Endurance track would be showed during the event only. Each teams have to complete the 7 lap in endurance the team making the 7 laps in minimum time would be given the maximum marks. The Night Racing is a tentative event if the permission of the night racing is achieved by the Government officials and would be confirmed 3 weeks before the main event date.

**NOTE- ALL THE PENELTIES WOULD CLEAR DURING AND BEFORE THE EVENT AND ALL THE REPORTS MUST BE IN HARD COPY.**



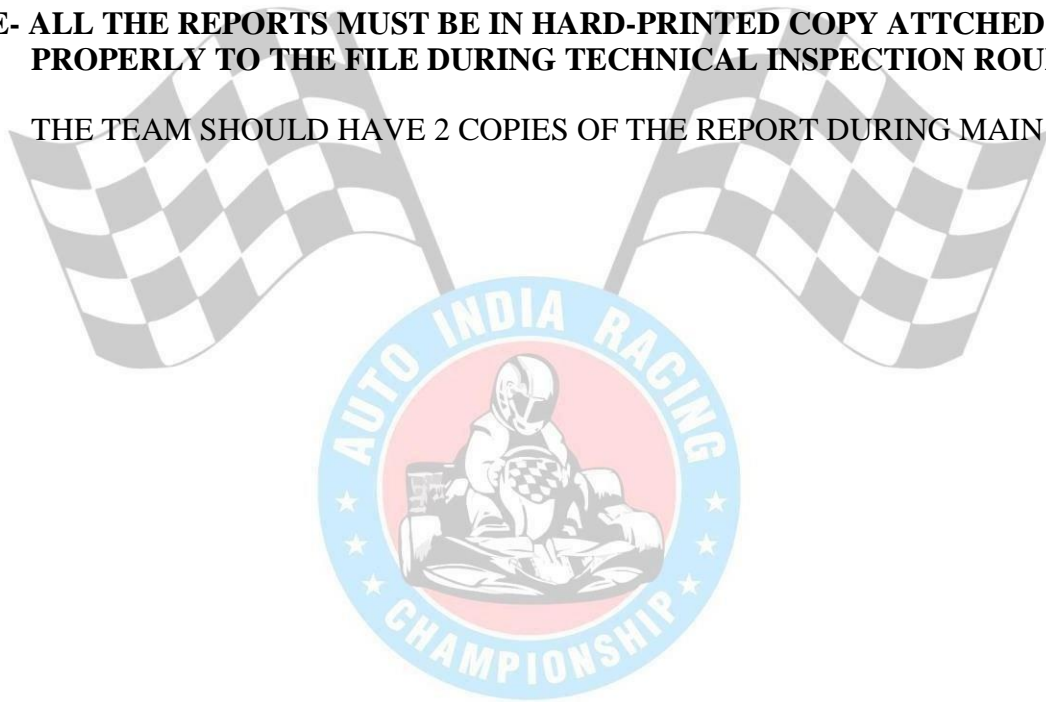
## 8. Report Submissions

There is online design report submission for AIRC 2019-20 events. However, teams' progress will be evaluated continuously throughout the season. Teams will be asked to submit the reports and other documents time to time before the pre-decided deadlines. Following documents shall be required for submission:

1. Project Plan
2. Design Report (with calculations)
3. CAD/CAE Report
4. Cost Estimation
5. Chassis/Kart CAD files (.cat /.iges /.sat /.stp /.prt & .stp)

**NOTE- ALL THE REPORTS MUST BE IN HARD-PRINTED COPY ATTCHED PROPERLY TO THE FILE DURING TECHNICAL INSPECTION ROUND.**

THE TEAM SHOULD HAVE 2 COPIES OF THE REPORT DURING MAIN EVENT.



# 9. Marking & Scoring

## SECTION A

Events	Maximum Marks
<b>A. Documentation</b>	<b>100</b>
<b>B. Static Event</b>	
Design Evaluation	100
Cost Evaluation	100
Light Weight Score	100
Go-NoGo Test	100
<b>Total Score</b>	<b>400</b>
<b>C. Dynamic Events</b>	
Acceleration Test	200
Autocross Test	200
Skid-Pad	200
Endurance Run	400
<b>Total Score</b>	<b>1000</b>
<b>Overall Event Score (A+B+C)</b>	<b>1500</b>

## **SECTION B**

### **Penalties**

#### **1. Document submission -**

The late submission or failure to submission of design report, cost report, Technical Inspection Sheet, calculation report, design presentation will lead to 50 points standard penalty. If you submit design report 1 hour late or 1 week late, you will be applied with only 50 points penalty.

#### **2. Manufacturing photos and video submission penalty-**

If any team fails to present the required proof of manufacturing, they will be penalized up to 50 points.

#### **3. violations to flags-**

If any drivers do not obey flags, the team will be penalized for 50 points.

#### **4. Vehicle movements-**

Teams are restricted to use the power of engine other than dynamic events. If any team uses power of engine for movement, they will get penalty of 50 points without any prior warning.

#### **5. Misbehavior or arguments with officials or volunteers-**

100 points or Disqualification or ban for 3 years.

#### **6. Changes in vehicle after TI –**

Teams are not allowed to make changes in vehicle after technical inspection. If any team found while changing any parameter. They will have penalty of 100 points or disqualification.

# 10. Prize Money

## OVERALL EVENT

<b>Champions</b>	<b>Rs 1,00,000/-</b>
<b>1<sup>st</sup> runner up</b>	<b>Rs 75000/-</b>
<b>2<sup>nd</sup> runner up</b>	<b>Rs 50000/-</b>
<b>3<sup>rd</sup> runner up</b>	<b>Rs 25000/-</b>
<b>4<sup>th</sup> runner up</b>	<b>Rs 10000/-</b>

## MAIN EVENTs

<b>EVENTS</b>	<b>Winner</b>	<b>Runner Up 1<sup>st</sup></b>	<b>Runner Up 2<sup>nd</sup></b>
<b>Design</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>CAE</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Acceleration</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Skid pad</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Auto-Cross</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Innovation</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Aesthetic</b>	<b>Rs 10000/-</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>
<b>Other Awards</b>			
<b>Girls' Team</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>	
<b>Best Captain</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>	<b>Rs 3000/-</b>
<b>Best Driver</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>	<b>Rs 3000/-</b>
<b>Social Media</b>	<b>Rs 7000/-</b>	<b>Rs 5000/-</b>	<b>Rs 3000/-</b>
<b>Dronacharya</b>	<b>Medal</b>	<b>Medal</b>	<b>Medal</b>

**NOTE-** Here Girls' Team refers that the entire team should not involve any boy member in The Team. (Expect Faculty Advisor)

**Lots of Surprising Prizes and Gifts would be also distributed at the time of main event from sponsors .... !!!!**

# 11. AIRC Rules And Organization Authority

## a. Authority of Rules

The AIRC Rules are the responsibility of the Go-kart Technical Committee and are issued under the authority of AIRC.

- Official announcements from the Go-kart Technical Committee shall be considered part of rules and shall have the same validity as these rules even if these not initially included in the rulebook and communicated later on.
- Ambiguities or questions concerning the meaning or intent of these rules will be resolved by the Go-kart Technical Committee only.

## b. Rules for 2019-2020

Go-Kart 2019-20 is being organized as **RIGIDITY** season of AIRC Go-Kart. There are several major & minor changes in the rules and some more new rules are also introduced. Teams must consider the rules given in this document only as effective rules for **RIGIDITY** season. Teams must try to design and fabricate a vehicle with good build quality as well as efficient dynamic performance. Build quality shall be considered as an overall combination of multiple parameters including but not limited to structural quality/strength, vehicle overall configuration, ergonomic design and aesthetic presentation etc.

**DO NOT ATTEMPT to design your vehicle as per the rules of any previous season.**

## c. Penalties

Organizers have the right to modify the penalties listed in the various dynamic event descriptions to better reflect the design of their event courses, the course lengths or any special conditions unique to the site. The standard dynamic event penalties in these rules are default values that will be applied unless there is a change by the organizer.

## d. Right to Impound

Go-Kart Technical Committee reserves the right to impound any on-site registered vehicle at any time during the competition for inspection and examination by the organizers, officials and technical inspectors.

## e. General Authority

AIRC organizers reserve the right to revise the schedule of the competition and/or interpret or modify the competition rules at any time and in any manner that is in their sole judgment, required for the efficient and smooth operation of the event.

# 12. Registration Procedure

## a. Online Registration

Teams are required to register online at the AIRC website [www.autoindiaracing.com](http://www.autoindiaracing.com) [www.autoindiaracing.club](http://www.autoindiaracing.club) all updates would be put up on the website and official Face book group and it is the responsibility of the teams to check these updates time to time. A Minimum of 15 to Maximum of 25 student members is allowed per team to participate in the competition. The team has to fill the registration form and mail the scanned copy of the form in .pdf format at [autoindiaracing@gmail.com](mailto:autoindiaracing@gmail.com) e-mail address.

## b. Event Site Registration

The teams shall mark their presence at final event by registering at event site on the 1st day of event. All participants must provide the following documents –

- A valid driving license issued by the Government as a photographic proof for the Drivers. For other team members, college ID or any other substitute alternate document for a photographic identification.
- Emergency contact data [point of contact (e.g. parent, guardian or spouse), relationship, and phone number].
- PAN Card copy of at least one team member/captain/faculty advisor.

### • Registration Fees\*

Total registration fees for AIRC 2019-2020 event will be INR 20,000/-. The registration fee will be submitted in 2 phases as below:

1. Phase-I: INR 10,000/-
2. Phase-II: INR 10,000/-

**\*Registration fee is non-refundable.**

## BANK DETAILS

Bank Name	IDBI Bank
Branch	opp. Moze College, Wagholi
Account No	1784102000002653
IFSC code	IBKL0001784
Holders Name	Auto India Racing Championship

## 13. Tentative Schedule

SR.NO	EVENTS	DETAILS
1	REGISTRATION ( <a href="http://www.autoindiaracing.com">www.autoindiaracing.com</a> )	1 <sup>ST</sup> JULY 2019 – 30 <sup>th</sup> OCT 2019
2	PHASE-1 FEES PAYMENT (Rs.10,000/-)	1 <sup>ST</sup> AUG 2019 – 15 <sup>th</sup> NOV 2019
3	WORKSHOP (Go-Kart)	DEC 2019
4	PRE-FINAL ROUND (Online Round)	JAN 2020
5	PHASE-2 FEES PAYMENT (Rs.10,000/-) + GST	JAN 2020
6	COLLEGE LEVEL TI (Online/Offline)	FEB 2020
7	FINAL ROUND (Main Event)	FEB 2020



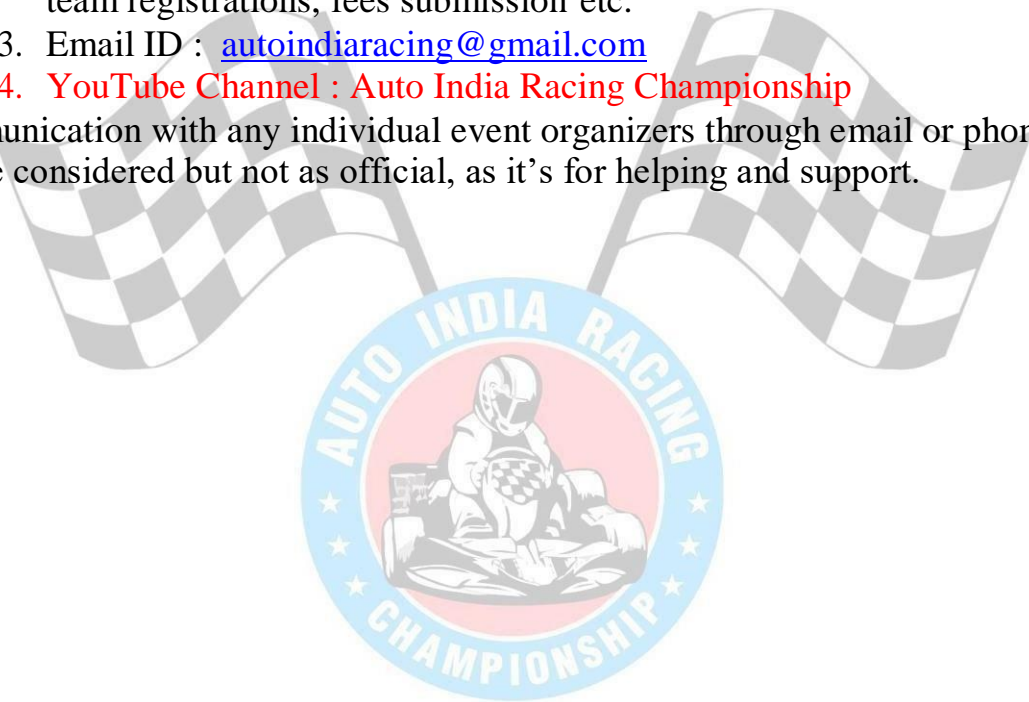
# 14. Official Communication

All teams must pay attention to the official announcement made by Go-Kart Organizers. All official announcements will be posted on website [www.autoindiaracing.com](http://www.autoindiaracing.com) and [www.autoindiaracing.club](http://www.autoindiaracing.club) or at official Face book Group [www.facebook.com/groups/Auto India Racing Championship](http://www.facebook.com/groups/Auto%20India%20Racing%20Championship). Event organizers or Go-Kart Technical Committee may directly communicate to teams/captains/ faculty advisors to provide any additional information.

Following are the official email IDs for the communication with competition organizers:

1. [autoindiaracing@gmail.com](mailto:autoindiaracing@gmail.com) : for technical queries, rules clarifications, event procedures etc.
2. [autoindiaracing@gmail.com](mailto:autoindiaracing@gmail.com): for general queries regarding team registrations, fees submission etc.
3. Email ID : [autoindiaracing@gmail.com](mailto:autoindiaracing@gmail.com)
4. **YouTube Channel : Auto India Racing Championship**

Communication with any individual event organizers through email or phone calls will be considered but not as official, as it's for helping and support.



*All The Best!*





*!!.....journey starts with passion.....!!*