

INTERNATIONAL GOKART CHAMPIONSHIP SEASON-8

RULEBOOK 2019-20



INTERNATIONAL GO-KART CHAMPIONSHIP

LPU SAEINDIA COLLEGIATE CLUB



Organized by:-



DISCLAIMER: This is the official Rule book of **International Go-Kart Championship - 2019-20** which is made by taking the reference of previous year rule book- IGC 2018-19. The Teams are advised to download it from the official website of www.igc-lpu.com. IGC 2019-20 is not liable or responsible for any kind of mistakes done by the teams if they downloaded any fake rule book from any other link other than www.igc-lpu.com.

Dear Teams,

Go through the rule book carefully. Read and understand each point properly. It is suggested that the teams must take a print out of the rulebook, sit together and debate on the perception of each rule. Highlight important points, and ready to refer the hand-outs.

Do not misunderstand any rule. If clarification regarding any rule is required, you must contact us. We will always be glad to help you out.

All the best Team
International Go-kart Championship

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Let's Go- Karting.....

FOREWORD:

DEAR INTERNATIONAL GO-KART CHAMPIONSHIP COMPETITORS, FRIENDS AND ENTHUSIASTS.

International Go-Kart Championship is a global student challenge with a mission of encrypting students with technical as well as practical knowledge of manufacturing a go-kart. This Challenge is a global platform to show best of the talent to create what participants thought and designed on an international level. International Go-kart Championship originated with a purpose to bring the students out of their classes and implement what they learned.

From past seven years, IGC has been reaching its milestones more than 100+ teams registered in previous year across the globe. This year competition standards have remarkably changed. The competition will be undertaken as follows:

ABOUT THE RULES

The full rules for International Go-Kart Championship 2019-20 events in India comprised of the International Go-Kart Championship 2018-19 Official Rules Chapter, here in after referred to as "Official Rules" which can be downloaded from the International Go-Kart Championship website once available (<http://www.igc-lpu.com>)

It is the responsibility of every participating team to read and understand the given rules in the rule book. To highlight rule changes and aid the understanding of frequently misunderstood rules, several tools have been used in this document:

- Text set in italic indicates a note or explanation of the rule above to aid its understanding.
- Drawings are used throughout this document to explain certain rules and illustrate acceptable and non-acceptable.

In this document, functions and roles are defined as follows:

- 'Organizers' –LSCC (LPU SAEINDIA COLLEGIATE CLUB) organizes the International Go-Kart Championship in Lovely Professional University.
- 'Team' – Group of individuals who are registered students of a recognized university/college with a team name and one vehicle that has been accepted for entry to the International Go-Kart Championship 2018-19.
- 'Team Member' – Member of a Team.
- 'Team Manager' – A participant that has been appointed on the event registration document as a single focal point for his/her team towards the Organizers.
- 'Event Head' – Person appointed by the Organizers, who is responsible to manage and sanction all on-track activities.



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- 'Track Marshall' – Person appointed by the Event head to act on his / her behalf to ensure on track safety and observe on-track rule compliance.
- 'Fuel Marshall' – Person appointed by the Organizers, works as a member of the technical team and supervises fuelling activities in line with the requirements of these rules.
- 'Technical Head' – Person appointed by the Organizers, who is responsible to ensure the technical standards and integrity of the International Go-Kart Championship 2019-20.
- Faculty Supervisor- He/she is faculty of Institution to which the team belongs to, who is responsible for team officially on behalf of Institution and simultaneously a guide for best performance of the team in the challenge.
- Convener- He is a person who is responsible for the overall conduct of the event.
- Coordinator- He/she is a person responsible for coordination of department given to him/her by Organizing Committee.
- Driver- He/she would nominate a member of a team responsible for driving the vehicle in the dynamic event on behalf of the team.





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A. PREFACE

A1. ABOUT LPU SAEINDIA COLLEGIATE CLUB:

LPU SAEINDIA COLLEGIATE CLUB (LSCC) is a student organization of Lovely Professional University, Jalandhar (Punjab) which indulge in Motorsport activities in the Country, taking into consideration for future endeavours of an individual and his exposure to various Alma maters. LSCC is affiliated to Society of Automotive Engineers INDIA chapter, an International organization which sets standards in the automobile industry and now is a leading platform for exposure to budding Engineers. The main agenda behind this is to get each and every college indulge in such kind of activities which provides a competitive environment to the students and also inspire them to come up with new and innovative ideas. From the last six years, LSCC is organizing this Go-kart racing event. In the first year it was given the name as National Go-Kart championship 2012-13 which was a great success with 26 teams in Dynamic Phase. In season II, this event was organized by the name of International Go-kart Championship 2013-14 (IGC2013-14) as it was taken to international standards in which 120 teams participated from all over India and the world. In the year 2015-16, 200+ teams registered for the event and 100 teams qualified for the final round from across the globe. The year 2017 experienced more than 100 teams registered for the event and 51 teams qualified for the final event. In 2018, LSCC hosted it with vibrant participation of 140 Teams where 32 Teams clinched their path to endurance. This is the seventh time LSCC is organizing this event in which participants will come up with their passion driven karts with an aim to accomplish the motive of “engineering excellence”.

A2. ABOUT INTERNATIONAL GO KART CHAMPIONSHIP

International Go-Kart Championship is a global student challenge with a mission of encrypting students with technical as well as practical knowledge of manufacturing and building up a go-kart. The mission is accomplished by the ambition of these students to compete globally. These go-karting enthusiasts already have a lot of adrenaline and drawn on eyebrows in the last season of International Go-Kart Championship.

International Go Kart Championship invites participation in two categories

1. COMBUSTION VEHICLE(M-KART)
2. ELECTRIC VEHICLE(E-KART)

A3. JUDGING CATEGORIES

- The karts are judged in a series of static and dynamic events.

The dynamic events are scored to determine how well the car performs. Each dynamic event has specified minimum acceptable performance levels that are reflected in the scoring equations.



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The following is the point distribution:

Static Events	
Virtual Design Report Submission	50
Design Presentation	100
Quality manufacturing	50
Business Plan presentation	50
Cost report	50
Innovation	50
Dynamic Events	
Acceleration	100
Skid pad	100
Autocross	150
Endurance	300
Total	1000

A4. VEHICLE ELIGIBILITY

- **Student Developed Vehicle:** Karts must be conceived, designed, fabricated and maintained by the student team members without direct involvement from professional engineers, automotive engineers, racers, machinists or related professionals.
- **Information Sources:** The student team may use any literature or Knowledge related to kart design and information from professionals or from academics as long as the information is given as a discussion of alternatives with their pros and cons.

B. ABOUT THE RULES

It is the responsibility of every member of the teams to know and understand the rules before the event. If any rule is doubtful, clarification must be sought from organizers through written media at least 60 days prior to the event.

B1. RESPONSIBILITIES

The driver or guardian of each kart is responsible for the safe operation and condition of the equipment and they are responsible for their actions as well as any crew member's actions while participating in an IGC event.

B2. DRIVERS MEETING

Every competitor is required to attend the drivers meeting. If a competitor does not attend the meeting, he/she loses the right to protest. A roll call may or may not be called at the Race Director's discretion.

B3. SPIRIT AND INTENT

This document provides specifications to assure engine, kart and any components used should be legal. IGC officials have the right to review and to determine if a person (builder or competitor) has changed or re-designed any part or



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component that would gain an advantage or bend the rules. If a competitor is deemed in violation of the spirit and intent rule, he or she may be disqualified. If this document does not say you can, then you can't. When it states shall, then you must. When it states you may, then it is permitted. Calls on and off the track are in the eyes of the IGC officials. IGC has the right to confiscate any parts or components up to, and including, complete karts or engines for further inspection.

B4. SOCIAL MEDIA

When differences of opinion arise regarding IGC rules and regulations, decisions by IGC officials, IGC policies, or between the competitors (and/or their charges), communication and discussion of these differences are best handled privately and directly between the parties involved. Attacking parties on social media sites like Facebook, Instagram or Twitter is unacceptable and may result in disciplinary action. If the Series Director determines that the communication is not in the best interest of the IGC, resulting penalties may be a disqualification, ejection from the event and possibly from IGC until further notice.

B5. LIABILITY

All participants must sign a waiver releasing IGC and officials of liability before participating in an IGC event. The signee agrees to hold IGC and officials harmless from all liability. This includes but is not limited to: injury to person, employees, property and or reputation that may be sustained by signee, from all claims of injuries at present and future.

Transportation is the sole responsibility of Team and the committee isn't responsible for it.

B6. ID CARD

Everyone is required to wear a pit pass/ID card at all IGC events.

B7. ADULTERATION

Any Team and its member are strictly abstained from any kind of intoxication or consumption of any adulterants (Tobacco products). If found so may lead to strict disciplinary actions and suspension from the event till the committee and university claims to be as per its norms and regulations.

B8. THREATENING ACTIONS

Threatening actions such as intimidation, verbal abuse or physical violence to any IGC official, participant or spectator at an event could result in disqualification from the event, and possibly from IGC until further notice.

B9. PROTEST

It is the intent of the IGC that every effort will be made to resolve all protests at the track before the weekend event ends. The rules and regulations in the IGC Rule Book will govern the IGC. If needed, an IGC committee will be involved. All on track penalties will be decided at the event. Any protest of technical specification legality and driver conduct must be submitted in writing by a legal entrant from the same area in which the alleged violation occurred. If a kart specification is protested, the protesting driver's own kart can also be subject to full inspection. If an engine specification is protested, the protesting driver's engine can also be subject to full inspection. The protest must be



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submitted in writing within 30 minutes after the technical decision has been made by an official. Once a competitor's equipment has been removed from the impound area, he or she has waived the right to file a protest. All protests must be submitted in writing to the Race Director (or designated official) of the IGC or sanctioned event within 30 minutes after the completion of the race that is being protested, or in the case of a scoring protest, 30 minutes after official results have been announced or posted. The written protest must refer to the specific rule in the IGC rule book and page number. Anyone filing a protest on another competitor's equipment must keep his or her own equipment in the impound area following the race until the protest has been resolved. Once a competitor's equipment has been removed from the impound area, he or she has waived the right to file a protest on another competitor's equipment regardless of whether 30 minutes have elapsed from the completion of the race in question. If a driver's finishing position is adversely affected by an incident on the track, the driver cannot be reinstated to his or her previous position. However, this does not prevent the driver from filing a protest after the race to argue a position penalty given by the officials.

B10. ILLEGAL EQUIPMENT

Any illegal parts or components that are found during tech or inspection may be impounded for further inspection. If further inspection parts are found illegal, IGC has the right to keep the part or equipment. Penalties could be handed out from the result of the inspection.

B11. DRIVER PENALTIES

IGC officials have the right to penalize a driver to meet the severity of the driver's actions. Some examples are a loss of position, start at the rear of the field, disqualification, probation or suspension.

B12. SUSPENSION

IGC officials can suspend a driver, participant or spectator for a set amount of time/races as determined by IGC. This is normally for rule violations. During this time the driver, participant or spectator will not be allowed to attend any IGC events for the period determined.

B13. APPEAL

If a person has been suspended, they can submit an appeal letter to IGC for the officials to review. The outcome of this review will be the final decision.

B14. REGISTRATION PACKET

Each team or faculty advisor shall pick up the registration packet from the IGC designated area. The team's Pit Pass shall be obtained with the receiving packet. The crew member or faculty advisor may be allowed to pick up packet if they have their ID proof with them.

B15. CHANGES IN TEAM STRUCTURE

We understand there will be a time when your team structure may require a redesigning. So, we allow you to do the following changes. Dates for the changes will be notified to the teams through official communication channels used.



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B16. CHANGE OF FACULTY ADVISOR

Team Can Change the Faculty Advisor with proper reason mentioned in the application. Refer to Annexure I (A) for the format of application. After completion of the application, it is needed to be uploaded in your IGC account on the website (www.igc-lpu.com) when the links opens.

B17. ADDING OR DELETING A TEAM MEMBER

Link will be open for it on your IGC account on the website (www.igc-lpu.com) once and after that link closes, we will not entertain any kind of requests for the change of team member or any change of information. So be careful while filling your details so that further faults in your certificates or official documents can be avoided.

B18. CHANGE OF TEAM CAPTAIN

If a team wants to change the Team Captain, then the team can do so with proper reason mentioned in the application. Refer to Annexure II (B). After completion of the application, it is needed to be uploaded in your IGC account on the website (www.igc-lpu.com) when the links open.

B19. TEAM NAME

No two teams will have same names. So it is recommended not to copy names. In the case of any dispute, the team using the name from the past will be given authority to use the name. If any two new teams uses the same name than the team registered first with full payment will retain the name and another team will have to change the team name.

Guidelines for selecting a name for the team:

- Team Name should not hurt the sentiments of any person/religion and should not have any religious word.
- Team Name should not criticize any social action of any group of people or an Individual.
- Choose a decent name to maintain sportsman spirit.



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C. GENERAL TEAM REQUIREMENTS

C1. DRIVER'S REQUIREMENTS

C1.1. Age

Team can have Two Drivers and both drivers must be 18 years or above. The Age of a driver is determined by the driver's actual age at the start of the calendar year (Jan 1st). It's the decision of Team to go with a single driver or dual; The Event summons for at least one approved Driver.

C1.2. Driver's License

Both drivers must have a valid driving license issued by Government of India for four wheelers. Learner's license is not allowed. Original license must be presented when demanded and at the time of final event both the drivers must have their driver's license always present with them.

C1.3. Medical Insurance

Drivers must possess a valid medical insurance which must be presented when asked by the organizers. This insurance must cover accidents.

C2. REGISTRATION REQUIREMENTS

C2.1. Team Requirement

The team registering for International Go-kart Championship must have a Team Name, Team Logo, Team Captain and a Faculty Facilitator.

C2.2. Discipline

All the team members must be from engineering diploma/degree

C2.3. Team Registration

The complete registration process will be done through www.igc-lpu.com. The team must create an account mentioning each detail. A maximum of 25 team members may participate in a team.

C2.4. Registration Fee-

- Registration fee after 31st August 2019– INR 20,000
- Early bird Registration fee till 31st August 2019– INR 18,000
- Registration fee for last year endurance qualified teams till 31st August 2019– INR 16,500

No fee will be accepted after the specified dates of registrations. Once registration amount is deposited, then the teams have to submit a scanned copy of Deposition slip or DD on their account on the website of IGC (www.igc-lpu.com) within 72 hours after uploading scan copy, team fee status will be updated as paid.



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ACCOUNT DETAILS

Account Holder: LPU SAEINDIA Collegiate Club

Account No: 4942002100000169

Bank: Punjab National Bank

IFSC Code: PUNB0494200

DEMAND DRAFT

Drawn on Name: LPU SAEINDIA Collegiate Club

Payable At: Chaheru

Note: After depositing the amount or sending the demand draft to official postal address, don't forget to upload payment slip or scan of demand draft on your account on the website. Do mention all the necessary team details with the team at back side of demand draft.

Once paid, the Registration fee will not be refunded in any case.

OFFICIAL POSTAL ADDRESS

INTERNATIONAL GO-KART CHAMPIONSHIP

C/o LPU SAEINDIA Collegiate Club,

Block 55 Room No.204 Cabin 3,

School of Mechanical Engineering

Lovely Professional University, Phagwara, Punjab,

India (144411)



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C3. QUERY ABOUT THE RULES

C3.1. Query type

(Must be through only team id/advisor Id): The Committee will answer any query that is not already answered in the rules that require new or novel rule interpretations. The Committee will not respond to questions that are already answered in the rules. For example, if a rule specifies a minimum dimension for a part the Committee will not answer questions asking if a smaller dimension can be used.

C3.2. Query submission

Teams can submit their query to our official mail ID lpusaeindia@lpu.co.in . The query should be done by only team mail Id.

C3.3. Subject of Email

The subject of email for Rules query should be in the following format-

TeamName_RulesQuery_RuleNumber

Example- Chetak_RulesQuery_D5.1

C3.4. Query Format

The following information is required:

(a) Submitter's Name (b) Submitter's Email (c) Topic (Select from the pull-down menu) (d) College/University name (e) Keep your HOD/Adviser in CC.

C3.5. Response Time

The Rules Committee will respond as quickly as possible, however, responses to questions presenting new issues, or of unusual complexity, may take more than two weeks. Please do not resend questions.

C4. QUESTION & QUERIES HELPLINE

Helpline

Email Address: lpusaeindia@lpu.co.in

Website: www.igc-lpu.com

Contact Number: +91-9101284523 Mr. Archiman (Student Co-ordinator)

D. TECHNICAL RULES

D1. GENERAL VEHICLE RULE

D1.1. Chassis Requirements

The vehicle must have four (4) wheels that should not be in a straight line in longitudinal direction. Holes in chassis are not permitted except the inspection holes. Holes must be drilled in low stress areas.

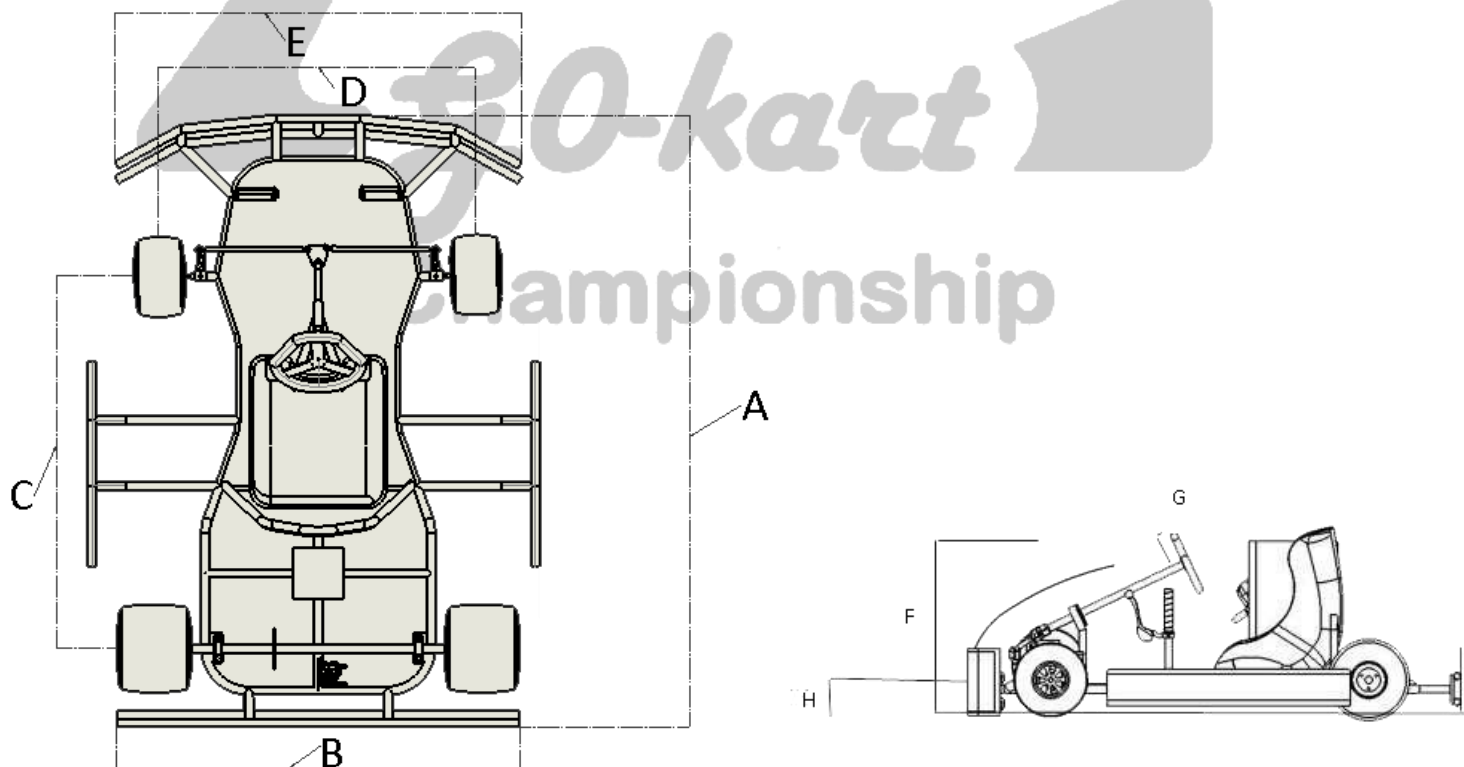
D1.2. Frame

The main frame should be round tubing with a minimum diameter of 1.0", a maximum diameter of 2" and Minimum wall thickness of 1.5 mm. The tubes used in the fabrication of the chassis or the other frames/supports must be **seamless** (No weld line present in the pipe, it should be single surface).

D1.3. The material testing certificate is essentially required during Static & Dynamic events

The material should be certified from any of the material testing laboratories for its chemical and mechanical properties, the same report should be presented at the time of inspection and throughout the event. **Teams must use a material having properties equal to or more than AISI 1018. The Team must give an opening or hole so as to measure the thickness of pipe by judging panel.**

D2. CHASSIS DESIGN REQUIREMENTS



KART DIMENSIONS		
All Measurements Are Done With Wheels Straight Ahead & No Driver		
LETTER	DESCRIPTION	MEASUREMENT
A	Maximum Length	90"
B	Rear Bumper Width	Should be wider than the outer edges of the rear Tires.
C	Minimum Wheel Base	40"
D	Track width	Smaller track width must be minimum 65% -75% of the wheel base
E	Front Bumper Width	Should be wider than the outer edges of the front Tires
F	Height of steering from the ground	Adjust it according to height of the driver
G	Distance between the steering and the Fairing	2"
H	Ground Clearance	1.25" to 4"
I	Maximum Weight	230Kg (without driver)
J	Dist. Between steering wheel & driver chest	Minimum 6"

D3. SHAFT

- The drive shaft must be a one piece steel or titanium shaft; it can be solid or tubular.
- The drive shaft should be installed using sound Engineering practices.
- It is required to positive lock the drive shaft to the hub.
- Set screw is not allowed to use as a positive locking of shaft. Additional positive locking must be provided.
- Some of the ways for *Additional* positive locking can be- metal lock nut, nylock nut, or snap ring, etc.



Fig: Using a snap ring, or lock nut for positive locking is acceptable.



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Note: Teams are advised to use following table if required (for shaft, but you are advised to use a solid shaft)

Thinner Titanium shaft is also allowed, however, with proper validation report

MAX EXT. DIA (MM)	MIN.THICKNESS(MM)
50	1.9
49	2.0
48	2.0
47	2.1
46	2.2
45	2.3
44	2.4
43	2.5
42	2.6
41	2.8
40	2.9
39	3.1
38	3.2
37	3.4
36	3.6
35	3.8
34	4.0
33	4.2
32	4.4
31	4.7
30	4.9
29	5.2
28	Full
27	Full
26	Full
25	Full

D4. FLOOR PAN

Floor/belly pan is mandatory: a full floor pan is required and it should not extend outside of the frame from front to rear or from side to side, this includes during rain condition. **The suggested and mandatory norm is to have it till driver compartment.** The floor/belly pan must not extend above the centre line of the axle. It must be of rigid material. **If it is perforated, the holes must not have a diameter of more than 10 mm.** In addition, one hole with a maximum diameter of 40 mm is allowed for the sole purpose of steering column access.

D5. STEERING:

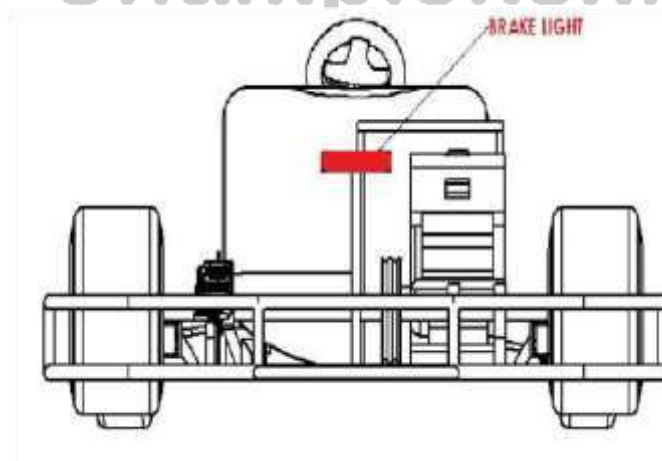
The steering system must be able to control front two wheels. The steering system must have both positive steering stops that prevent the steering linkages from locking up in right or left hand turning. The stops may be placed on the Stub axle or on the rack and must prevent the tires from contacting body, or Frame members during the track events. Allowable total steering system free Play (inclusive of play in all the steering linkages) is limited to 7 degrees, Measured at the steering wheel. The steering wheel should be solid and fixed; besides its recommended to have continuous too. The steering wheel must be mechanically connected to the front wheels, i.e. *steer- by-wire or electronic steering is prohibited.*

D6. BRAKING:

The brake system installed must be capable of stopping the vehicle in a straight line without losing control during the brake test. *The vehicle must have a hydraulic braking system and the pedal must directly actuate the master cylinder through a rigid link (cables are not allowed).* All brake lines must be securely mounted and not fall below any portion of the vehicle. Electronic braking systems are strictly prohibited. Bleeding ports for disc calliper should be upside to that of piston mechanism of the calliper. There should be no leakage from the master cylinder, reservoir or brake lines. Dual system or four wheel brakes are allowed. If a dual system is used- it must be two separate brake systems; if a brake bias is used- it must not affect either system if one would fail. An exception may be requested by a driver with a disability and must be approved by IGC. Brake by Wire is not allowed.

D6.1. Brake light

The vehicle must be installed with a brake light red in colour which is clearly visible by the rear vehicle. If an LED brake light is used, it must be clearly visible in day light. **This light must be mounted at least ONE FOOT (12 inches) above the ground.** All the electrical connections done must be well insulated and should be tied properly. The **Light should also be bolted properly and must be properly rigid.**



Note: Image is provided for reference only.

D7. SUSPENSION (IF APPLICABLE)

Maximum travel of suspension should be of **1inch** and it should in proper working condition.

D8. STARTING SYSTEM:

Every kart must be either electric start or recoil or pull start. Karts with bike engine should be equipped with an on-board starter switch which must be used to start the engine always by the driver itself.

Note: Positive lock and recoil spring must be provided with the throttle pedal.

D9. POWER TRAIN GUARDS:

All rotating parts such as belts, chains, and sprockets that rotate must be shielded to prevent injury. These guards/shields must extend around the periphery of the belt or chain and must be 3 TIMES wider than the rotating part. The mounting should be rigid to resist noise and vibration. Rotating parts must also be guarded all around in addition to preventing searching fingers from getting caught in any rotating part. **Fabric coverings such as “Frog skin”, Coenobite, and neoprene are unacceptable for use as finger guards.**



Fig: Powertrain Guards

D11. SEAT BELT

The vehicle must be installed with either one of the mentioned seat belt and driver should be strapped with these belts when he/she is sitting on the driving seat and the vehicle is moving at any point in time during the event. Vehicles without the seatbelt will not be allowed to participate in any stage of the dynamic event. Seat belt mounting should be rigid. For the safety of the driver, the seat belt must be installed in the vehicle. If team goes without retractor then it must opt for seatbelts as of GYPSY or so. The seatbelts must not be damaged at any instance.

The seat belt must be either a 3 point or a 5 point harness.



Fig: Seat belt for reference.

D12. DRIVER SEAT

Driver Seat Should be a bucket seat as shown in the figure below:



Fig: Bucket Seat

The seat mounting must be rigid enough to withstand the various forces act on the driver when the vehicle is in a dynamic condition. The Driver's seat must be designed in such a way that it prevents lateral motion of the driver when multi-directional forces act on him when cornering or braking. The seat must not protrude below the lowest plane of the chassis frame under any condition. ***The seat must be mounted rigidly with at least four mounting with the chassis.***

D13. WHEELS AND TIRES

Teams must use standard go-karting tyres.

TYRES	DIMENSIONS(IN INCHES)
FRONT	10x4.5-5
REAR	11x7.1-5

The tyre should be rigidly fixed and there must not be any play. ***It should be bolted by the lock nut or crown nut with a split pin.*** There should be at least 3 threads on all bolts attaching wheel to hub and hub to shafts.

Both Wet & Dry Tires are allowed.

D14. KILL SWITCH

The electrical system must include **two kill switches**. ***The kill switches must deactivate the engine ignition and starter motor connections.*** The kill switches must **NOT** deactivate the brake light in any condition. Kill switch must kill the engine on push, not on the pull. Kill switch must be push pull type.

Push pull kill switch are mandatory as shown in figure below:



Fig: Push Pull Kill Switch

D15. LOCATION-COCKPIT SWITCH

The cockpit switch must be located in the cockpit within easy reach of the driver. The switch must not be mounted on a steering wheel.

D16. EXTERNAL SWITCH

The external switch should be mounted on either side of the driver (LH or RH) of the vehicle and must be within easy reach of the volunteers. The switch must be mounted rigidly with no sharp edges nearby.

D17. BRAKE OVER TRAVEL SWITCH

Brake over travel switch is required to kill the engine but the Brake light must glow on over travel too.



Fig: Brake Over travel switch

D18. FIRE EXTINGUISHER

Each team must have at least **two** fire extinguishers of **ABC type 1 kg** each. *It should be accompanied with a sticker of team id and college name and a bill clearly mentioning its expiry date.* A fire extinguisher should be in proper working condition. Mounting should be rigid. Fire extinguisher placed on the vehicle must be properly visible and easily removable. Another one should be with team members. **Any team without the fire extinguisher will not be allowed in technical and design inspection.**



Fig: Fire extinguisher (ABC or equivalent)

D19. BUMPER

The bumpers should be built of steel or aluminium tubes. It's mandatory on the front, rear and side protections. Bumper should have an opening at any of its side to check the thickness.

Note: No part of chassis or driver body should project outside frame in running condition (Actuated or Non Actuated).

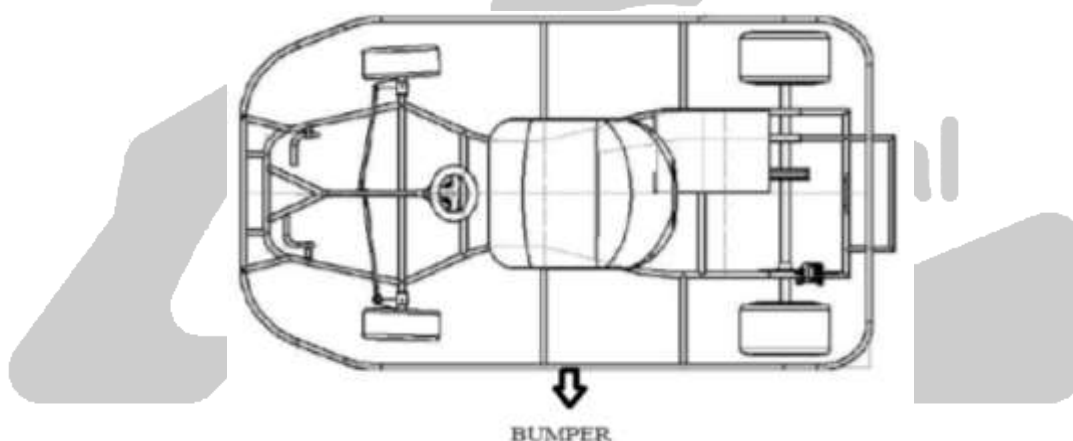
Bumper shouldn't be considered as part of frame.

D19.1. Front and Rear

1. The bumper must consist in at least 2 tubular elements.
2. A tube with a minimum diameter of 19 mm and a minimum thickness of 1.5mm, both bars being connected together.
3. This bumper must be independent of the attachment of the pedals i.e. no pedals should be attached or supported with the bumper.
4. The front bumper must permit the attachment of the mandatory front fairing.
5. It must be attached to the frame at least by **4 points**.

D19.2. Side bumpers

1. They must be composed of an upper and lower tubular bar.
2. They must allow the attachment of the mandatory side bodywork.
3. They must have a minimum outer diameter of 19 mm and thickness of 1.5 mm.
4. They must be attached to the frame at least by **2 points**.
5. These 2 attachments must be parallel to the ground and perpendicular to the axis of the frame
6. Side bumpers should be outside the tires, in such a way that they protect the tires from collisions.



Note: Reference images for bumpers

D20. BODYWORKS

- Teams are free to use OEM or self-designed bodyworks.
- All bodyworks should be properly secured to the kart.
- Sharp edges on the body works and other protruding components are prohibited.
- Each kart should have space for sticking the following stickers-
 - 4x6" TI sticker
 - IGC, LSCC Sticker
 - Event Sponsor's stickers

D21. ELECTRICAL SYSTEM

1. All the electric wires should be tied properly and insulated.
2. No loose wire is allowed and must not go under the frame of the vehicle.
3. A team must have circuit diagrams; FMEA (failure mode effect analysis) and validation report with them, if the team is buying any OEM circuit/component then they should have Certificate /Tax Invoice.
4. Battery Terminal should be covered and insulated
5. All Electrical systems must be protected from moisture (in case of rain).

D22. VEHICLE IDENTIFICATION (VIN)

Every team will have separate team number given by organizing management. Along with that team must have their own unique team logo and their respective college logo situated on the vehicle. The Vehicle Identification Number must be placed at three positions which are as follows.

1. Front of vehicle
2. Right side of vehicle
3. Left side of vehicle

Note: Team must have space for event logos and all of them should be placed on the vehicle at the position specified during the event. The team will not be allowed to continue if the logos and VIN are not correctly.

D23. FASTENER

D23.1 Fastener Grade Requirements

Threaded fasteners utilized must meet or exceed either, SAE Grade 5, Metric Grade 8.8 and/or AN/MS specifications.

D23.2 Where ever the fasteners are used there must be at least 3 threads outside of nut.

D23.3 Fasteners Captive (Positive locking)

Fasteners must be made captive through the use of NYLON locknuts, Metal lock nuts, split pin, or safety wired bolts (in blind applications). Lock washers or thread sealants do not meet this requirement.



Fig: Some of the recommended positive locking mechanisms (viz. from L to R- nylock nut, metal lock nut, split-pin, safety wire)..

D24. PEDALS

- The accelerator pedal must be operated by Right foot.
- No pedal should bend/deform in case of panic operation) braking, etc.
- The foot pedal must return to its original rearmost position when released. The foot pedal must have positive stops at both ends of its travel.



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E. COMBUSTION POWERTRAINS AND SYSTEMS (m-KART specific)

E1. Engine

There is no restriction on using a specific engine. Teams are free to select any engine meeting following requirements

Engine Type	Single Cylinder, Four Stroke Gasoline Engine
Cooling System	Air /water
Maximum Capacity	150cc(Automotive engine) 160cc(Industrial engine)
Type of Transmission	Manual gearbox / CVT / Centrifugal Clutch type

E2. ENGINE REGISTRATION

The teams will have to produce an invoice of the engine with engine specifications from a dealer or on the college letter head duly signed and attested by the dean of the concerned college.

E3. EXHAUST SYSTEM

Use of suitable catalytic converter or mufflers is recommended. The exhaust system must be properly shielded preventing the delicate parts which may get affected if exposed to the heat. The exhaust must be mounted properly to avoid the physical contacts of the viewers or the technical inspectors. **Exhaust sound should not exceed 116 decibels at full throttle.** Exhaust system should be inside your chassis periphery.

Exhaust Outlet Height from the ground should be less than 60cm (0.6 metres).

Exhaust Wrap shouldn't be wound around muffler and is compulsory till exhaust tail.

Note: The exhaust wrap should be properly set before, any kind of smoke at the time of the event will not be entertained.

E4. FIRE WALL

E4.1. For rear mounted engine

The firewall must separate the driver compartment from all components of the fuel supply, the engine, the liquid cooling systems and any high voltage system. It must fully protect the driver and should be extended two (2) inches above the lowest point of the helmet of the driver. The firewall must be a non-permeable surface made from a rigid, fire resistant material. The firewall must seal completely especially at the sides and the floor. There can be no holes in a firewall through which seat belts pass. Pass-through for wiring, cables, etc. are allowable but pass-through has to be sealed properly. **The firewall must be of at least 1mm thickness. It should be rigid and properly covered.**

Clearance between the firewall and any exhaust component must be at least 1".

E4.2 For side mounted engine

The firewall must separate the driver compartment from all components of the fuel supply, the engine, the liquid cooling systems and any high voltage system. It must fully protect the driver and should be extended to the driver's shoulder. The firewall must be a non-permeable surface made from a rigid, fire resistant material. The firewall must be sealed completely especially at the sides and the floor. Engine should be covered from the top so that no part of the engine is visible in the top view. The firewall must be kept at a minimum distance of 1 inch from the driver seat. There can be no holes in a firewall through which seat belts pass. Pass-through for wiring, cables, etc. are allowable but pass-through must be sealed properly. **The firewall must be of at least 1mm thickness.**

E5. THE PATH FOR WIRES AND PIPES

No pipelines/wire connections should go outside or below the frame. It is strictly prohibited. Doing so will lead to disqualification of the team. **Plastic fuel lines between the fuel tank and the engine (supply and return) are prohibited.** All fuel lines must be shielded from all possible rotating equipment failure or collision damage. **All fuel line must be away from engine & should properly clamp, only metallic (as shown below) clamps are allowed to be used for fuel lines.**



Fig: Either of the two clamps are allowed

E6. DRIP PAN MOUNTING

Drip pans must be mounted using sound engineering practices. A drip pan mounting comprised only of fastening to the fuel tank filler neck is insufficient, and is not allowed. Drip pans must be graded or inclined such that all spilled fuel drains from the drip pan, fuel must not pool anywhere in the pan.

E6.1. DRIP PAN DRAIN

Fuel must drain from the drip pan through a drain line composed of pipe or tubing that carries fuel to the bottom of the vehicle and releases under the vehicle. Fuel should NOT be released onto the belly pan, flotation, or any other part of the vehicle. The drain line shall be robust and be mechanically fastened to the drip pan with a threaded connection or a hose barb and hose clamp, or a combination of the two. Adhesive connections are specifically prohibited.

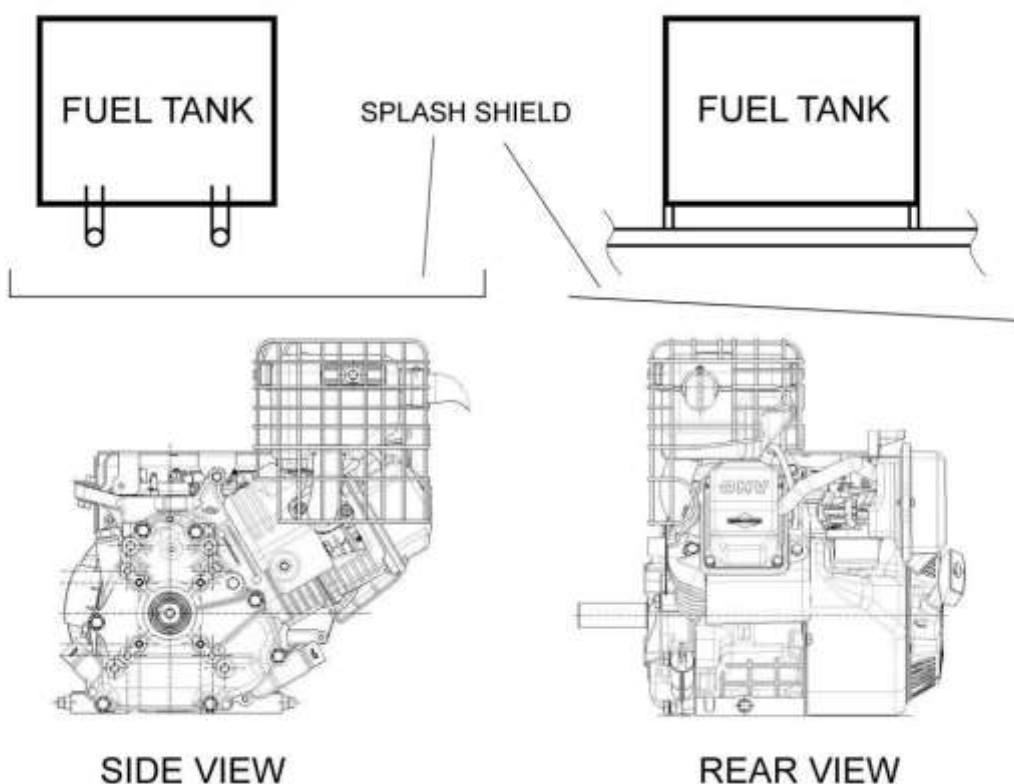


Fig: Fuel system, splash guard installation example (For remote mounting of fuel tank)

E6.2. SPLASH SHIELDS

The splash shield can be prepared by two methods:

1. Integrated Splash shield with Drip Pan. The flow must be towards a common drip pipe and there should be no logging of liquid.
2. Separate splash shield that covers the complete engine from the fuel tank.

E7. FUEL LINES

- If the fuel line passes through the splash shield, it must either pass through a grommet hole in the shield, or utilize a metallic barbed bulkhead union (recommended). With either method, the hole must be sealed to prevent spilled fuel from leaking to the engine.
- If fuel tank is mounted near the engine or exhaust component, splash shield must prevent the spilled fuel to the engine from the fuel tank.
- Splash shield material must be fire resistant.



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F. ELECTRICAL POWERTRAINS AND SYSTEMS (e-KART specific)

F1. THE MOTOR

- Motor Type- DC/AC
- Maximum Power - 10kW
- Maximum Voltage - 96V
- The maximum power drawn from the battery must not exceed 10kW. Teams can use multiple motors
- Motor must draw power output more than 10 KW any time in the event.

F2. MOTOR CONTROLLER

The speed controller for the motor should be in accordance with the motor specification. A higher grade controller is always beneficial to avoid cut offs. For a motor connected at 48V the controller will be rated higher than 48V to avoid controller damage. Teams are free to use any type of controller suitable with motor and battery package.

F3. THE BATTERY

- Teams must use a battery of the following configuration:
Maximum voltage: 96V

Maximum Capacity: 120AH

- The teams can use either of the following of types of the batteries – lead acid, Li-ion
- The Battery must be rigidly fixed in the vehicle with good engineering practices.
- Battery terminals must be properly insulated.
- It is allowed to use separate 9V battery for Brake light.

F4. BATTERY PACKAGING

- The firewall must separate the driver from the motor and all the electrical transmission units.
- All the batteries must be packaged inside a battery packaging unit.
- The casing of the battery should be fixed/welded/fastened (using locknuts) with the chassis.
- If power storage pack is capable of spilling dangerous liquids when damaged, there must be a spill-proof barrier between that storage pack and the driver.
- The cover material must be fire and electric proof and properly insulated by fiber. Flexible rubber or plastic sheets are not allowed to be used as covers.
- The battery cover should be made up of rigid plastic/glass fiber/sheet metal, with an insulating coating.

F5. Fuse or circuit breaker

One or more Fuses or circuit breaker should be installed in the power line i.e. from batteries to controller, to shut down the vehicle in the event of a fault in traction circuit. Minimum of 1 fuse (rating \leq max System Current) is mandatory at primary output of battery; If vehicle electronics(e.g. lightings) operates at separate voltage, 1 Fuse or circuit breaker is mandatory in that circuit. Under no circumstances teams will be allowed on track without specified fuses installed. All fuse locations must be chosen such that they are easily accessible for verification/replacement. Fuse specification should be clearly readable. Cartridge fuses are recommended.

F6. BATTERY MANAGEMENT SYSTEM (BMS)

- OEM BMS are allowed.

- Teams have the liberty to self-design and fabricate their BMS. In such a case, teams must present a report of the same. Design methodology, circuit diagrams, computation, communication and codes (if applicable) are to be mentioned in this report. Battery connection to load circuit should be clearly mentioned in the report.
- In case of accumulators that may vent an explosive gas must have a ventilation system or pressure relief valve to prevent the vented gas from reaching an explosive concentration.

F7. ACCUMULATORS

- Use of Accumulators is permitted.
- If used, teams must present a report of the same. IGC expects team members to have a thorough understanding of the working and functioning of accumulators they are using.

F8. TRACTIVE SYSTEM INSULATION, WIRING AND CONDUIT

- Non-conductive covering must prevent inadvertent human contact with any tractive system voltage. All the tractive systems components shall be mounted onto the vehicle with secure and rigid packaging.
- All parts, especially live wires, contacts, etc. of the tractive system need to be isolated by non-conductive material or covers to be protected from being touched. All the wires shall be properly routed. The battery terminals and other HV contact points shall be properly insulated with best engineering practices.
- Tractive system components and containers must be protected from moisture in the form of rain or puddles.
- Only insulation material that is appropriate for the expected surrounding temperatures may be used and this must have a minimum temperature rating of 90°C. Using only insulating tape or rubber-like paint for insulation is prohibited.
- Tractive system wiring must be shielded against damage by rotating and / or moving parts.





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G. DRIVER'S SAFETY GEARS

The following are the minimum requirements and restrictions that will be enforced through technical inspection and at any stage of competition. Noncompliance if any observed by the inspection/organizing/judging committee members must be corrected and no vehicles without passing the technical inspection would be allowed to participate further in the event.

Team must have one complete driving gears set.

All the parts of Driver's Safety Gear must meet the required rating (specified). No driver would be allowed to drive the vehicle without the complete driver's safety gear in any of the dynamic event will consist of the following items:

a. **Driver's 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. The minimum acceptable certification required –
-SFI 3-2A/1 (equivalent or higher)

-FIA Standard 1986

b. **Underclothing**- It is strongly recommended that Drivers must wear fire resistant underclothing under their driver's suit. Or if not possible then wear cotton underclothing (full sleeve t-shirt and long underpants).

c. **Helmet**- A well-fitting closed face helmet that meets one of the following certifications and is labeled as such
- DOT

- Snell K2000, K2005, K2010, M2000, M2005, M2010, SA2000,

SA2005, SA2010 or equivalent

- SFI 31.2A, SFI 31.1/2005

- FIA 8860-2004, FIA 8860-2010

- ISI Rated Standard Helmet

Open-faced and motocross helmets are not allowed. All helmets to be used in the competition must be presented during Technical Inspection where approved helmets will be stickered. The organizer reserves the right to impound all non-approved helmets until the end of the competition.

d. **Neck Support**- The neck support must be a full circle (360°) and SFI rated. Horseshoe collars are not allowed. Beltenick, Simpson, RCI, GForce, Deist or Leaf Racing Products supply neck collars that meet this requirement.

e. **Gloves**- **SFI 3-2A/1 (equivalent or higher)**. Good quality, fire resistant leather gloves are also acceptable.

f. **Balaclava**- it should be made of fire resistant material which must cover driver's head, hairs and neck or a full helmet skirt of acceptable fire resistant material. Necessary for both genders

g. **Shoes**- Fire resistant shoes made from acceptable fire resistant material shoes must be certified to the standard and labelled as such:

-SFI 3.3



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-FIA 8856-2000

Good quality, fire resistant high-ankle leather shoes are also acceptable.

- h. **Socks** - Fire resistant socks made from acceptable fire resistant material that cover the exposed skin between the driver's suit and the shoes.

Note: Although good quality leather fire resistant gloves and shoes are allowed, IGC strongly recommends teams to use SFI/FIA rated safety gears only.

Sport shoes/Canvas shoes/Industrial safety shoes are not allowed at any point of the event.

H. EVENT

International Go-Kart Championship is a global student challenge with a mission of encrypting students with technical as well as practical knowledge of manufacturing a go-kart. This Challenge is a global platform to show best of the talent to inscribe, imbibe and implement their so concepts and bring out their best of their skills and to inspect it on an International Podium.

International Go-kart Championship came up with an agenda to let students encroach the barrier of their class with books and implement what they learned. From past 7 years, IGC has been reaching its milestones more than 100+ teams registered in previous year across the globe. This year competition standards have remarkably changed. The competition will be undertaken as follows:

H1. PHASE ONE – TEAM REGISTRATION

In this part, the team will register itself until **30th September 2019** with complete payment (by any of methods mentioned in your IGC accounts on www.igc-lpu.com). The complete registration process will be done through www.igc-lpu.com the team have to create an account mentioning every detail as per asked a maximum of 25 members can be in the team. Maximum 120 teams will be allowed to register.

H2. PHASE TWO – REPORT SUBMISSION

After the registration process is over teams will start working on reports and they will have to upload their reports on their IGC account when the link opens. The team will be evaluated on their capabilities, engineering excellence and skills to fabricate a go-kart. This round is a screening round this round helps IGC to see whether teams who registered for IGC have enough skill-set to manufacture a go-kart and that team found with low skill set will be rejected. And this round is a Qualifying Round.

There will be 300 points for the report and the marks will be disclosed during the final event. A team will have to score at least min. of 50% of marks achieved by the highest scoring team in this round to qualify the First Phase.

Late submission of the reports will lead to penalties.

Imp. Note: Marks achieved in the report submission round will have a weightage of 50 points in the Overall Points table.



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H2.1 REPORTS THAT NEEDS TO BE UPLOADED:

1. Design report which contains
 - Abstract
 - Introduction (Technical DATA) & Design Methodology.
 - Chassis (CAD Design, CAE Analysis).
 - Steering and Suspensions (Design methodology, Technical Data)
 - Transmission (Calculation)
 - Brake (Design Methodology and Procedure, Technical Data) System Used
 - Electric System (With Circuit Diagram)
 - Innovation
2. Proposed cost report (Pre-manufacturing expenditure analysis)
3. DVP (Design validation plan according to rule book)
4. DFMEA (Design failure mode and effect analysis)
5. PFMEA (Process failure mode and effect analysis)
6. Team structure & responsibilities
7. Gantt Chart (Time management of manufacturing period)

Note:

1. See Annexure 1 for Detail of Report
2. Add Calculation (EX:-Bearing Selection, Design Calculation and Material Selection)

8. Energy Storage system (For Electric Category only):

This report will include –

- Battery Specifications with scan copy of the original bill and data sheet, for the electric category.
- Calculations resulting in the selection of battery.
- Battery limitations and failure report.

9. Electrical Connection Report (For Electric Category only):

This report will include, but not limited to –

- Block diagram of the whole electrical circuit.
- Schematic, wiring diagram and blueprint using any Electrical Diagram Software.
Proper circuit diagram and blueprint of innovations used.



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S.NO	CATEGORIES AWARD			POINTS
1.	DESIGN REPORT	SUB CATEGORIES	AWARD POINTS	150
		IEEE FORMAT	10	
		CAD MODEL	30	
		ERGONOMICS	30	
		ANALYSIS & CALCULATIONS	80	
2.	INNOVATION	CONCEPT & USEFULNESS	-	Points will be awarded at the time of final round
		FEASIBILITY	-	
		COST VS UTILITY	-	
		ECO FRIENDLY	-	
		PRESENTATION	-	
		INVESTMENT PLAN	-	
		PRODUCTION PLAN	-	
		MARKETING PLAN	-	
3.	PROPOSED COST REPORT (PRE MANUFACTURING EXPENDITURE ANALYSIS)			30
4.	DVP			30
5.	COST REPORT			30
6.	DFMEA			30
7.	PFMEA			30
TOTAL				300

Note: The 300 points scored will be converted to 50 points weightage at the final points table.

H2.2 College Level Technical Inspection:

- Teams are required to submit an only soft copy of T.I. a sheet as per given deadline. The format of Technical inspection sheet will be provided by IGC officials.
- Teams must prepare cross pad area as per given in rule book and make a video of complete lap of the vehicle on the same. And submit along with TI sheet in team account.
- The College level TI should be performed by the Team Faculty advisor.
- If teams fail to submit the same may not allow participating in the final round.



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H3. PHASE THREE- MAIN EVENT

Now come to third part and the most exciting one. In this, all the teams will head with their vehicle to India's largest private University i.e. **Lovely Professional University** where they will compete against other teams. Here they will be tested on various parameters and they must present their reports to judges, the teams which will qualify on all the aspects will finally races in front of 10000+ audiences live encouraging them to throttle fast and win.

Documents that needs to be submitted at Help Desk at the main event-

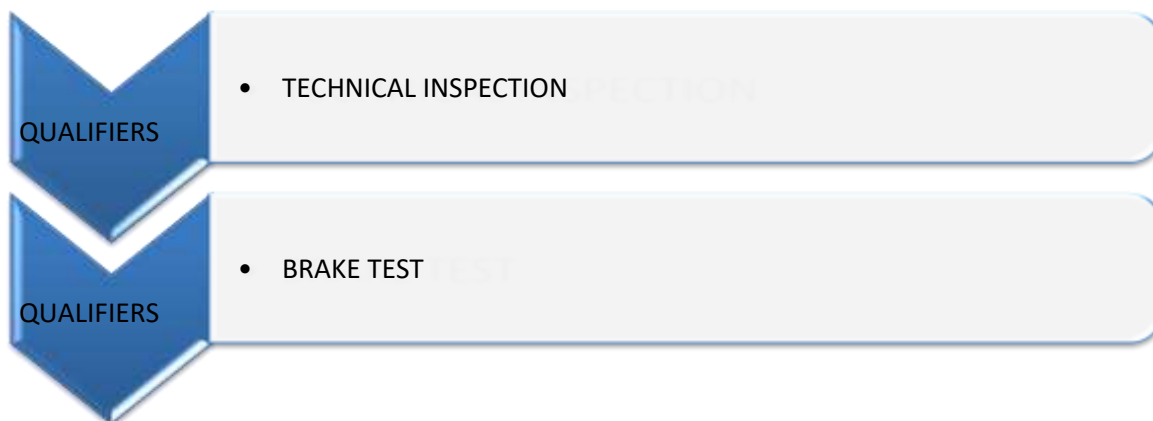
- Copy of all Team member's College/University I-card or any document recognizing that they are a student of that College/ University.
- Copy of Team Faculty advisor College/University I-card or any document recognizing that he/she is a faculty of that College/ University.
- Copy of Blood group report of Driver(s).
- Driver's driving license and medical insurance copy.





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CATEGORY WISE POINTS ALLOTTED FOR PHASE TWO:

S. No	CATEGORIES	AWARD POINTS
1.	Virtual Reports Submission	50
2.	Best Design Evaluation	100
3.	Quality of Manufacturing	50
4.	Business Plan	50
5.	Cost Report Presentation	50
6.	Innovation	50
7.	Acceleration	100
8.	Skid Pad	100
9.	Autocross	150
10.	Endurance	300

**No team will be nominated for an award if its Technical Inspection is not clear.*

*** Special designated competition can be announced during event. Also Special award will be awarded for the winning team.



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I. AWARD CATEGORIES

11. GENERAL RULES

- Total Cash Prize- INR 5 lakh+
- The following list (12) is a tentative Award list. IGC Season 8 Organizing committee reserves the right to omit and/or edit any of the award categories.

12. AWARD CATEGORIES- COMMON FOR e-kart & m-kart

CATEGORY	Award	
I. Best Design	1.	Best Design Winner
	2.	Best Design Award Runner Up
II. Business Plan	3.	Best Business Plan Winner
	4.	Best Business Plan Runner-up
III. Build Quality	5.	Best Build Quality Award
IV. Cost Report & Presentation	6.	Best Cost Report Winner
V. Innovation Award	7.	Best Innovation Award
VI. Dronacharya Award	8.	Dronacharya Award Winner
VII. Overall Static Award	9.	Overall Static Award Winner
VIII. Best Dressed Team Award	10.	Best Dressed Team Award Winner
IX. Engineering Excellence Award	11.	Engineering Excellence Award Winner
X. Endurance Ready	12.	First Team Ready for Endurance Award
XI. My Go-kart Story	13.	My Go-kart Story Winner
XII. Tug-of-war	14.	Tug-of-war Winner
	15.	Tug-of-war Runner-up
XIII. Optional Dynamic Event	16.	Optional Dynamic Event Winner
XIV. LSCC Future Award	17.	Team of the Year
	18.	Most Promising Team
	19.	Best Emerging Team
	20.	Rookie Team of the Year



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13. AWARD CATEGORIES (for m-kart)

CATEGORY	Award	
I. Overall Combustion Winner	21.	Overall Champion
	22.	Overall Runner Up
II. m-Endurance	23.	Endurance Winner
	24.	Endurance Runner Up
III. m-Skid-Pad	25.	Skid-Pad Winner
	26.	Skid-Pad First Runner Up
IV. m-Acceleration	27.	Acceleration Winner
	28.	Acceleration First Runner Up
V. m-Autocross	29.	Autocross Winner
	30.	Autocross First Runner Up
VI. Lightest Combustion Vehicle Award	31.	Lightest Vehicle Award Winner

13. AWARD CATEGORIES (for e-kart)

CATEGORY	Award	
I. Overall Electric Winner	32.	Overall Champion
	33.	Overall First Runner Up
II. e-Endurance	34.	Endurance Winner
	35.	Endurance Runner Up
III. e-Skid-Pad	36.	Skid-Pad Winner
	37.	Skid-Pad First Runner Up
IV. e-Acceleration	38.	Acceleration Winner
	39.	Acceleration First Runner Up
V. e-Autocross	40.	Autocross Winner
	41.	Autocross First Runner Up
VI. Lightest Electric Vehicle Award	42.	Lightest Vehicle Award Winner



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11. SPECIAL CATEGORY AWARDS

Apart from the regular awards based on the points scored by teams in the respective Static and Dynamic events, IGC 2020 will also feature a few “Special Category” awards. Participating in these events are not mandatory. The performance in these “Special Category” events won’t affect the points table or overall ranking of the team.

11.1. TUG OF WAR

- Introduced for the first time in IGC Season-7 (2018-19), this is a special category award.
- This is a fun event, conducted after the Endurance run.
- The organizers reserves the right to collect a registration fee (if need be) for this event from the teams participating in Tug of War.

11.2. LSCC Future Award

- This is a special category award which will be presented to **four selected teams**, each team getting award worth ₹ 35,000.
- This award can be used to pay IGC 2021 and IGC 2022 event registration fee, IGC pre-virtual seminar, various workshops, etc.
- The award money will be valid until March 2022.
- Teams will be judged on various criteria including- professionalism, planning, time management and coordination among teammates, pit neatness shown by the team throughout the event. The reports submitted in virtual round (Phase- Two) will also be considered.
- LSCC reserves the right to present these awards to any team.

11.3. SURPRISE EVENT

- Another special category event, this award is a surprise.
- IGC believes in change and is taking the lead in adding new and innovative ways to judge the talent of the teams, in new and innovative ways.



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J. STATIC EVENTS:

J1. TECHNICAL INSPECTION

It is mandatory to design and manufacturing the entire vehicle according to rule.

There are some steps of technical inspection as follow:

- Go/No-Go: Its geometrical check according to rule like
- Weight Check
- Engine Check
- Quality Check
- Safety Check
- Tilt Test
- Egress test

Corrections:

If a Go-Kart is deemed to a concern or does not comply with the rules, then a correction must be done to get re-inspected. Use of mechanical application (cutting, grinding, drilling, welding etc.) for correcting/ repairing kart can only be done in the Hot Pit provided. No team will be allowed to perform any mechanical process at Pit. Only 2 attempts will be given to clear their Technical Inspection. Within given time duration teams have to qualify T.I using their both chances. Its team owns the responsibility to line up and qualify Technical Inspection. Once the Kart passes the T.I no modifications are allowed. If any Kart found modified will be disqualified. Teams should go through the entire check list in the T.I sheets, prior to the final round to prevent disqualifications.

J2. DESIGN PRESENTATION (100 points)

There are 100 marks for design. All the team have to submit their design report and only 5 members are allowed to represent their department individually.

Note: Design report should be in the same format as specified in phase one of the event.

J3. COST REPORT PRESENTATION (50 points)

The team must have all the invoices with them while costing report presentation and an overall cost report. Judges will ask questions from teams and based on your answers you will be marked. Cost Event guidelines and other information will be updated to registered teams at www.igclpu.com

J4. BUSINESS PRESENTATION (50 points)

This would be an exciting part of an event where teams have to present a business plan. The team should consider that they have to manufacture go-karts on large scale and sell it- considering this situation team has to make a business plan and present it in front of judges, where judges will act as investors and mark you on basis of quality of your B-Plan.

The B-Plan should be in PowerPoint Presentation (.ppt format) and the same should be uploaded prior to the event within specified date.

Note: Teams need to carry a printed business plan and presentation while business plan presented during the event.

The Templates for Cost and Business Plan will be updated on the website and will be sending via emails.



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K. DYNAMIC AND ENDURANCE EVENTS

K1. BRAKE TEST

It's mandatory for a vehicle to pass the brake test to participate in any of the dynamic events. The vehicle must stop in a straight line after the brake is applied on the vehicle. Each vehicle will be given **only 3 attempts** to pass the brake test. But in case if the vehicle passes the test in the first attempt it will not be given any other trial.

At the finish line, the karts are expected to apply full brakes and the wheels must lock. After locking, rolling of tires (where the brakes are applied) will not be allowed in any circumstances.

Note: After applying brake vehicle should stop in a straight position (in the direction of motion) and Vehicle's speed must not be less than 35 KMPH while attempting brake test.

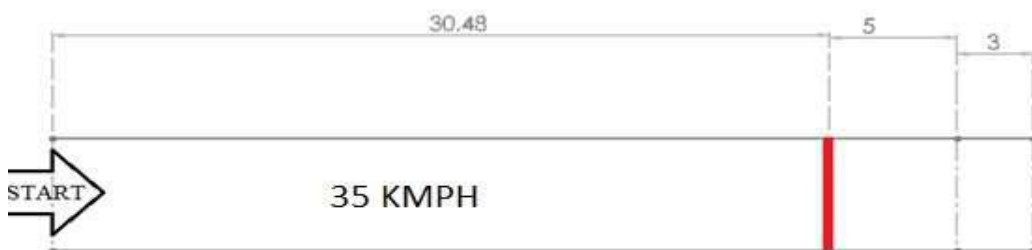
*** Brake Test is a Qualifier. Brake Test does not have any points, but without clearing Brake Test, no team will be allowed to attempt any other Dynamic event.*

K1.1 Brake Test Track

Length – 30.48m/100ft

Stopping distance – 8m

Minimum speed – 35 KMPH+



K2. ACCELERATION TEST (100 points)

Acceleration determines the time it takes the vehicle to accelerate along 100 ft. (30.48 m) flat course.

K2.1. Acceleration Track

Length – 30.48m/100ft





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Formula: Acceleration Score = $100 \text{ points} \times (t_{\max} - t_{\text{yours}}) / (t_{\max} - t_{\min})$

t_{\max} is 1.5 times limit of minimum time of any team

K2.2. Procedure

Each team may make two (2) attempts. Scoring will be based on the best of the two attempts. Timing may be done using either electronic systems or stop watches.

K3. SKID PAD TEST (100 points)

K3.1. Objective

The objective of the skid-pad event is to measure the vehicle's cornering ability on a flat surface while making a constant-radius turn.

K3.2. Skid Pad Layout

Inner diameter- 5m

Outer diameter- 10m

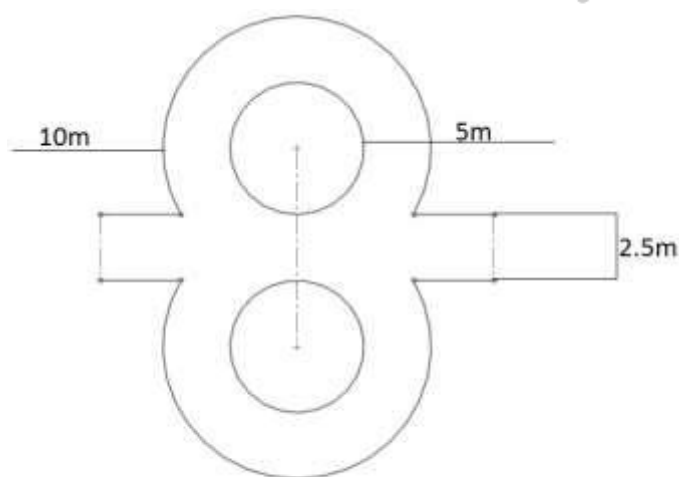
Width – 2.5m

Formula: Skidpad Score = $100 \text{ points} \times (((t_{\max}/t_{\text{yours}})^2 - 1) / (((t_{\max}/t_{\min})^2 - 1))$

T_{your} - the best Corrected Time for the team

T_{\min} - is the lowest Corrected Time recorded for any team

T_{\max} - 150% of T_{\min}





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K3.3. Procedure

The vehicles will enter tangential to both circles and follow the right circle for the first lap. The next lap will be on the same circle (right) and will be timed. Immediately after completing second lap, vehicle enters into the left circle for the third lap. Vehicle follows same circle for the fourth lap. Immediately after finishing fourth lap the vehicle will exit the track. The vehicle will exit at the intersection moving in the same direction as entered. A driver has the option to take a second run immediately after the first.

NOTE: Each team may make two (2) attempts. Scoring will be based on the better of the two attempts. Timing may be done using either electronic systems or stop watches.

K3.4. Penalties

- **Cones** - A penalty of 2 seconds will be added to the time for every cone touch (including gate cones).
- **Vehicles that spin-out** can continue as long as they have not gone off course. In case of off-course, it will be considered DNF.
- **Incorrect Laps**- Vehicles that do not follow procedure, i.e. run an incorrect number of laps or run the Laps in the wrong pattern will be classified as DNF.

K4. AUTOCROSS TEST (150 points)

K4.1. Objective

The objective of the autocross event is to evaluate the vehicle's manoeuvrability and handling qualities on a tight course. The autocross course will combine the performance features of acceleration, braking and cornering of the vehicle into one event.

Formula: Autocross score = $150 \times ((T_{\max}/T_{\text{team}})-1)/0.25$

T_{\max} is 2 times the time of the fastest vehicle including penalties.

K4.2. Procedure

The vehicle will be staged such that the front wheels are 6 m (19.7 feet) behind the starting line. The timer starts only after the vehicle crosses the start line. There will be no particular order of the vehicles to run each heat. The organizer will determine the allowable windows for each heat and retains the right to adjust for whether or technical delays. Vehicles that have not run by the end of the heat will be disqualified for that heat.

Note: Each team may make two (2) attempts. Scoring will be based on the better of the two attempts. Timing may be done using either electronic systems or stop watches.



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K4.3. Penalties

The carts are judged on elapsed time plus penalties. The following penalties will be added to the elapsed time:

- **Cones-** Two (2) seconds per cone touch/miss, including any after the finish line.
- **Off Course (OC)** – An "off course" occurs when the vehicle has all four (4) wheels outside the course boundary as indicated by (a) cones, (b) edge marking or (c) the edge of the paved surface. Where more than one boundary indicator is used on the same course, at any given point the narrowest track will be used when determining off course penalties. Driver must re-enter the track at or prior to the missed gate or a twenty (20) second penalty for every missed gate will be assessed. Penalties will not be assessed for accident avoidance or other reasons deemed sufficient by the track officials.
- **Missed Slalom-** Missing one or more gates of a given slalom will be counted as one "off-course" per occurrence. Each occurrence will incur a twenty (20) second penalty.

K5. ENDURANCE (300 points)

The following are general guidelines for conducting the endurance. The organizers reserve the right to establish procedures specific to the conduct of the event at the site.

K5.1. Objective

The Endurance Event is designed to evaluate the overall performance of the vehicle and to test the vehicle's reliability and durability.

NOTE: Right to Change Procedure- The following are general guidelines for conducting the endurance event. The organizers reserve the right to establish procedures specific to the conduct of the event at the site.

Formula: Endurance Score = 300 points x $(L_{\text{yours}} - L_{\text{lowest}}) / (L_{\text{highest}} - L_{\text{lowest}})$

L_{highest} highest number of laps completed by any vehicle

L_{yours} number of laps completed by the vehicle to be scored

L_{lowest} lowest number of laps completed by any vehicle

K5.2. Procedure

The event will be run as a heat for **1.5 hours (for m-kart) and 1 hour (for e-kart)**. Teams are not allowed to work on their vehicles during the heat. A driver can be changed according to the team at any time during the heat at a specified location. Wheel-to-wheel racing is prohibited. Passing another vehicle may only be done in an established passing zone. The team can stop their vehicle at our specified location for the fuel refill or driver change.



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K5.3. Penalties

The carts are judged on elapsed time plus penalties. The following penalties will be added to the elapsed time:

- Three (3) points for each cone touch.
- Off Course (OC) – An "off course" occurs when the vehicle has all four (4) wheels outside the course boundary as indicated by (a) cones, (b) edge marking or (c) the edge of the paved surface. Penalties will not be assessed for accident avoidance or other reasons deemed sufficient by the track officials.
- When re-entering the driver needs to wait for a gap and follow the instructions of the track marshals/race coordinators.
- DNF equals zero points.
- Failure to obey a flag: will lead to penalty.
- Vehicle to vehicle contact: Two minutes up to disqualification depending on the nature of the incident.
- Rash Driving is not permitted.
- Unsafe stop will lead to 10 points penalty.

K5.4. Flag Instructions:

Command Flags

Command flags are just that - flags that the competitor must immediately obey without question.

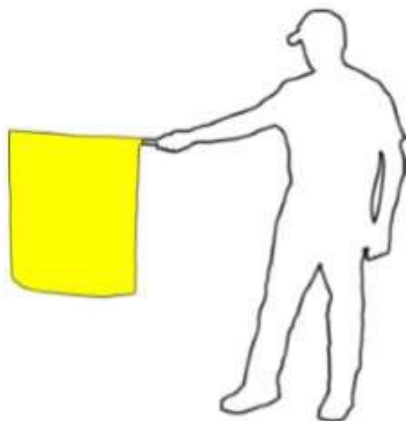
Green Flag -

- 1) When displayed at a starting line or when re-entering the course: The event has started; enter the course under the direction of the starter.
- 2) When running on the course: Course is clear, proceed.



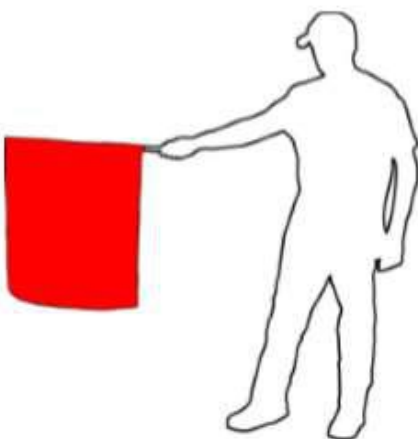
Yellow Flag –

When displayed, there is a dangerous situation on the track beyond the flag station. Reduce speed and be prepared to take evasive action or stop on the track. Passing is not permitted, unless directed by the course workers.



Red Flag –

When displayed, there is a dangerous situation somewhere on the track requiring a full-course stop. Come to an immediate, safe, and controlled stop on the course. Passing is not permitted. Pull to the side of the track as much as possible to keep the course open. Follow course worker directions.



Black Flag (Furled and Pointed) –

Warning, the officials are watching this vehicle's driving - obey the event rules.

Black Flag (Displayed) –

1) Pull into the penalty box for a discussion with the Technical Inspector or other official concerning an incident. A penalty may be assessed for the incident.

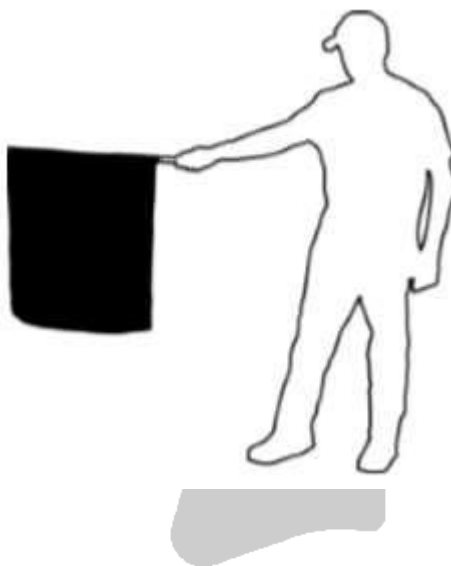


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2) Pull into the penalty box for a mechanical inspection of the car; a dangerous condition has been observed on the vehicle.



Chequered Flag –

The event has been completed. Exit the course as directed by event officials.





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ANNEXURE I

To
Organizing Team
International Go-Kart Championship

Subject: Change of faculty advisor of

Team _____

Team ID _____

Sir,

We members of team _____ team id _____

From college _____ request you to allow us to change our faculty
advisor due to following reason.

Name of New faculty advisor: _____

Contact Number: _____

College ID Number: _____ Email ID: _____ Thanking you

Yours Sincerely

Team _____

Signature Of Team Captain	Signature Of Faculty Advisor Leaving/ Dean/HOD Of Institution With College Stamp	Signature Of Faculty Advisor (New)



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ANNEXURE II

To
Organizing Team
International Go-Kart Championship

Subject: Change of Team Captain of

Team _____

Team ID _____

Sir,

We members of team _____ Team id _____

From college _____ request you to allow us to change our Team
Captain due to following reason.

Name of New Team Captain _____

Contact Number: _____

College ID Number: _____

Email ID: _____

Thanking you

Yours Sincerely

Team _____

Signature Captain	Signature Of Faculty Advisor Leaving/ Dean/HOD Of Institution With College Stamp	Dean/HOD Of Institution With College Stamp	Signature Of Team Captain (New)

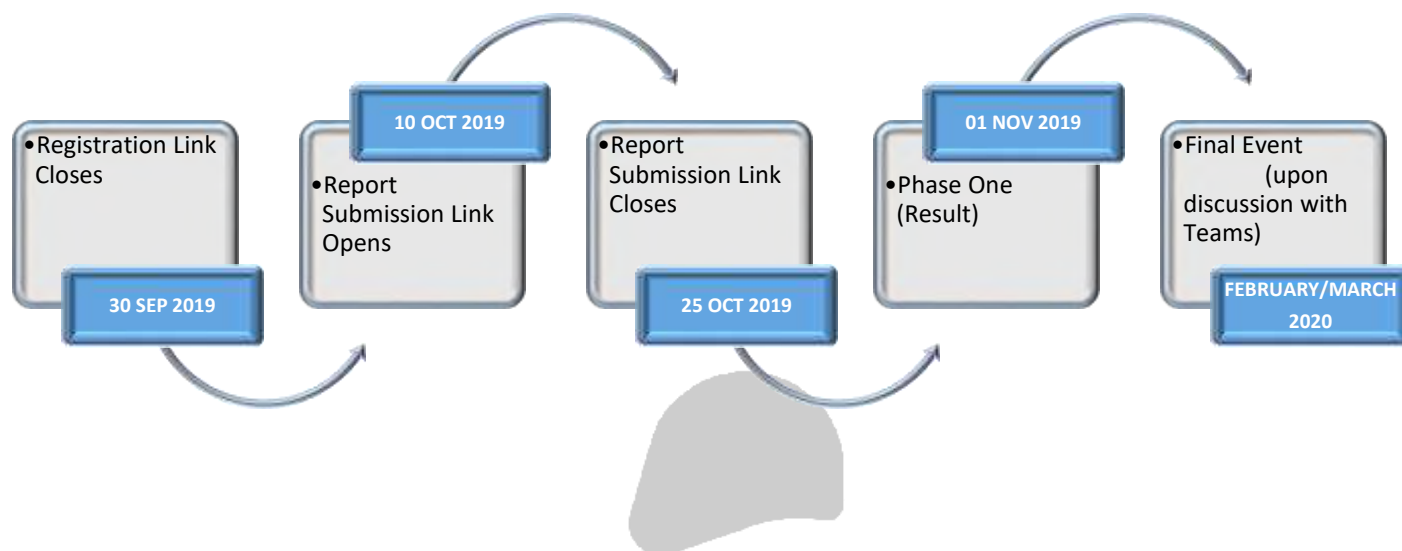


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TENTATIVE EVENT SCHEDULE - INTERNATIONAL GOKART CHAMPIONSHIP (2019-20)



**These dates are Tentative and can be altered followed by intimation to all the participating teams; Final event dates will be decided after taking feedback from teams,

The Pre-virtual Workshop are tentatively scheduled on October 2018, Interested Teams can reach us via the stated platform in case of any issue:

Email Address: lpusaeindia@lpu.co.in

Website: www.igc-lpu.com

Contact Number: +91-9101284523 Mr. Archiman (Student Co-ordinator)