





Introduction

Chandigarh University, is an autonomous body of Universal Learning located in Gharuan, Mohali, Punjab.

The campus spreads around 100 acres landscape known for its salubrious climate and presents congenial atmosphere.

Our infrastructure is vibrant in nature because of constant attempt to maintain pace with the development available. The infrastructure acts as a facilitator for the effective workflow of the system.

Chandigarh University provides various opportunities for the meritorious students all over the nation to participate in different events and ongoing live/R&D projects and to enhance their technical skills.

Objective: Engineering students from various college/university need to form a team to design & manufacture a Go-kart with in minimum budget

Registration process

The teams will register themselves online at the website: http://techinvent.cuchd.in/

Free registration fee

It is compulsory to have a minimum of **5** members in the team, and maximum 20 member are allowed.

Final Round

The Final event which will be held at **Chandigarh University**, **Gharuan**, **Mohali in Punjab**

This Round Comprises of points and the category wise Points distribution is mentioned below in the Rulebook.

This Round is considered to be the most challenging and exciting round for all the participants as this round declares the category wise winners of the event separately in Static and dynamic categories.

This is the only round where the participants need to represent their teams along with their own fabricated go-kart, and the stunning racers get the chance to show their passion in the field of racing.

Table of contents

- 1. General Rules for Participants
- 3. Rounds (detailed)

Final Round

Dynamic Round

- 4. Participation Requirements
- 5. Driver's Requirements
- **6. Vehicle General Requirements**
- 7. Vehicle Safety Requirements
- 8. Prize Categories
- 9. Contact address

1. General Rules for Participants:

- 1. Teams registering for the event must follow the Rules & Regulations mentioned herein the Rulebook.
- **2.** Every participant should have a Unique Code/College ID with visible Passport size photograph.
- **3.** Teams must manufacture the kart by themselves with in the college, any direct involvement of experts outside the college along with faculty advisor will directly lead to disqualification of team
- **4.** Teams cannot run their vehicle except during the dynamic round unless recommended by the organizers/coordinators.

5. Face-off with Organizers-

Argument or clash with any organizer may result in disqualification of team from the competition. All members of the team may be immediately escorted from the event arena.

6. Misconduct-

In the situation of misbehavior teams will be directly disqualified from the competition.

7. Smoke and Drug restriction-

Smoking, taking alcohol or illegal drugs, carrying weapons or other illegal material is strictly prohibited inside the campus as per the rules of the college. Any violation of this rule by any team member or faculty advisor will cause the penalization and disqualification of the entire team.

8. Right to Impound

During the event, any registered team can be called for technical inspection and examination at any point of time and stage and can be questioned for any technical element related to the vehicle during the event to any team member.

9. Query /protest:

We know that each and every team is doing hard work and working for long hours to complete their dream of making their own vehicle. In the heat of competition, emotions speak and disputes can arise. so looking over all VKC

3.1 Performance round

In this Performance Round, Teams should give a Presentation about their Vehicle along with complete Report Submission which should include:

- 1. Team structure.
- 2. Complete CAD model of the vehicle (Both 2D and 3D view)
- 3. Design analysis and calculation
- 4. Vehicle subsystem selection procedure with specification
 - 4.1 Chassis Material selection.
 - 4.2 Transmission
 - 4.3 Steering system.
 - 4.4 Braking system.
 - 4.5 Wheels.
 - 4.6 Bodyworks.
- 5. Dynamic calculations
 - 5.1 Transmission Calculation.
 - 5.2 Steering Calculation.
 - 5.3 Braking calculation.
- 6. DFMEA report
- 7. DVP report
- 8. Gantt chart
- 9. Cost Report

A separate guidelines docket will be mailed to the Teams after their successful payment, which must be followed by the teams for making their entire Report and Presentation.

3.2 Final Round

Final event will be held Chandigarh University NH-95 Chandigarh-Ludhiana Highway, Mohali, Punjab, INDIA from **31 March, 2017 to 1April, 2017.**

This Round is considered to be the most challenging and exciting round for all the participants as this round declares the category wise winners of the event separately in Static and dynamic categories.

This is the only round where the participants need to represent their teams along with their own fabricated go-kart, and the stunning racers get the chance to show their passion in the field of racing.

Dynamic Round:

1. **Technical Inspection-** The objective of Technical Inspection is to ensure safety and security of the driver with the vehicle. In this round, vehicle technical aspects will be crosschecked with the rulebook and pre-TI sheet of the teams.

Note- It is compulsory for the teams to fulfill all the vehicle requirements and driver's requirement to successfully clear their technical Inspection according to the Rule book. Teams are not allowed to make any changes once they successfully clear their T.I.

Only 2 attempts will be given to the teams to successfully clear their T.I.

Teams qualifying this round are only eligible for further rounds

Design Vs Manufacturing Check- The objective of this round is to verify design and manufacturing of the vehicle along with the technical knowledge of the team as per the specifications provided in their submitted report. The vehicle which covers a minimum of 5 laps in the final endurance round will only be eligible for Best Design Award.

Braking- In this round vehicle must reach a minimum speed of **30kmph** with in a distance of **50 meters** and should stop within a distance of **6 meters** with wheel locking. In order to qualify this round, teams need to clear the brake test within the specified limit in a maximum of **3** attempts. Teams qualifying this round are only eligible for further rounds.

Acceleration- In this round, the team need to accelerate their vehicle for 50 meters and the team which secures least time to cover the distance will be awarded Best Acceleration Award. There will be continuous 2 attempts for the it.

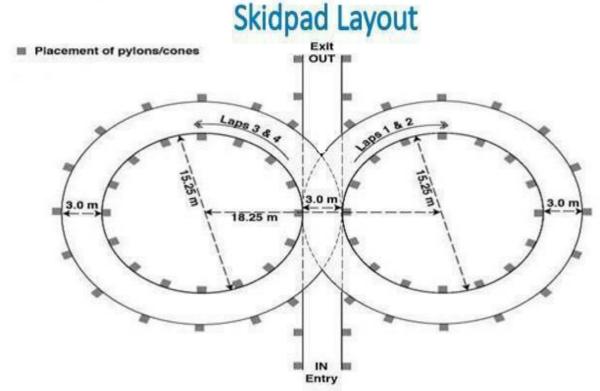
Acceleration Score = points $\times [(T_l - T_v) / (T_l - T_s)]$ Where:

 T_S = shortest time by any vehicle.

 T_{y} = time for the vehicle to be scored (your vehicle).

T_l= longest time by any vehicle.

Skid pad- The objective of the skid pad is to measure the vehicles cornering ability while making a constant-radius turn.



Execution- The vehicle will start from the entry zone and will take two complete laps on the right circle there after vehicle should take two complete laps on the left circle and proceed to the exit zone. The timer starts as soon as the front wheels of the vehicle cross the entry line and the timer will be turned off as soon as the front wheels of the vehicle crosses the exit line.

Note: Every team will be given two attempts; best out of two will be considered.

Skidpad = points $\times [(T_l - T_v)/(T_l - T_s)]$

Where:

 T_S = shortest time taken by any vehicle.

 T_{V} = Time taken by your vehicle.

 T_1 = longest time taken by any vehicle.

Penalty:

- There will be a penalty 2 seconds if the vehicle touches the boundary line or cone.
- There will be a disqualification of the attempt if more than 50% of the vehicle crosses the boundary line.
- There will be a penalty of 10seconds for each towing, if the vehicle is towed during the attempt. Only two team members will be allowed for towing.
- ☐ There will be a penalty of 10 more seconds for towing the vehicle apart from its towing point.
- **8. Autocross-1,2-** In this round the judges will evaluate the maneuverability, handling, cornering of the vehicle without any hindrance.

Autocross-1 is meant for both male & female drivers and Autocross-2 is meant only for Female driver.

Execution- Teams need to start the vehicle from the starting line and approach the finish line with certain directions and curves as directed by the cones laid on the track boundary. The timer starts as soon as the front wheels of the vehicle cross the entry/start line and the timer will be turned off as soon as the front wheels of the vehicle crosses the exit/finish line.

Note: Every team will be having two attempts; best out of two will be considered.

$Autocross = points \times [(T_l - T_v)/(T_l - T_s)]$

Where:

 T_S = shortest time taken by any vehicle.

 T_V = Time taken by your vehicle.

 T_{l} = longest time taken by any vehicle.

Penalty:

There will be a penalty of 2 seconds if the vehicle touches the boundary line, cone or tyres.

There will be a disqualification of the attempt if more than 50% of the vehicle crosses the boundary line, cone or tyres.

There will be a penalty of 10 seconds for each towing, if the vehicle is towed during the attempt by the coordinator/volunteer as per the drivers sign. No team members will be allowed for towing their vehicle on the track.

There will be a penalty of 05 seconds, if any of the tyre or cone dislocates from its point of placing on the track.

Lap endurance-This round is to check the performance of the vehicle on road

Guidelines- If any vehicle gets stopped in between the track, nearby volunteers will help to move the vehicle aside of the track after which driver can again restart the vehicle with necessary adjustments, no other team member will be allowed inside the track.

Procedure for Drivers change (optional):

In order to make a drivers change 1 driver has to enter into driver change area/lane and should halt his vehicle at the prescribed position (which will be mentioned at the time of final event) without killing/stopping the engine .As soon as st the 1 driver comes out of the vehicle 2 diver can step in but he/she can only leave the driver change area after the completion of mandatory checks for helmet and spilling of fuel.

Organizing team is not at all responsible for any accidents of the vehicles during the complete event, and the teams has no right to claim or blame the organizers for such cases.

Disqualification:

Any reckless or aggressive driving will result in a disqualification of team from the event.

4. Participation Requirements:

Team Name:

Every team should have a proper team name.

Team Logo:

Every team should have an attractive team logo (Not downloaded from internet or copied).

Team Captain/Vice-captain:

Every team should have a Team captain & Vice-captain.

Discipline:

Every team member must be an undergraduate perusing student.

Driver:

Every team must have a minimum of 2 drivers.

Team Size:

Every team should have a **minimum of 5 members** and **maximum of 35 members**, **Faculty Advisor:**

Every team should have a minimum of 1 & a maximum of 2 faculty advisors from any department. The faculty advisor should be appointed by their college/university.

NOTE: Multiple teams can participate from the same college/ university in

5. Driver's Requirements:

1. Driving License- Every team must have a minimum of **2** (two), the driver/drivers should have a valid four wheeler driving license (LMV) approved by RTA (Road Transport Authority).

Note- No LLR will be entertained.

2. Insurance- Driver/Drivers should have a valid Medical/Accidental/Life insurance. For any happenings, Driver/Drivers is the sole responsible for it and neither the event host institute nor the organizing committee will be responsible for any claim.

The name on the insurance bond should match with the name on the driving license.

Note- No team will be entertained without a valid Insurance.

3. Drivers safety gear-

- **3.1 Underclothing-** Driver/Drivers must wear a fire resistive cloth, a full sleeve and long pants. Cotton clothes are allowed for it. ankle (IF POSSIBLE)
- **3.2 Suit-** Driver/Drivers must wear fire-proof suit all the time when he/she is present in the cockpit. The suit should be of a single piece from neck to ankle (IF POSSIBLE)
- **3.3 Shoes-** Driver/Drivers must wear shoes.
- **3.4 Helmet-** Driver/Drivers must wear a well fitted helmet which should follow one of the certifications as mentioned below.
- **3.4 Neck Support-** Driver/Drivers must wear SFI rated 360 degree round neck support.(IF POSSIBLE)
- **3.5 Gloves-** Driver/Drivers must wear fire resistive gloves (IF POSSIBLE)

6. Vehicle General Requirements:

- 1. Maximum Length- Vehicle must not exceed the maximum length of 110 inches measured from the front to the rear impact bumpers.
- **2. Maximum Width-** Vehicle must not exceed the maximum width of **90 inches** measured from the left side to right side impact bumpers.
- 3. Wheelbase- Vehicle must have a minimum wheelbase of 36 inches.
- **4. Trackwidth-** Vehicle must have a minimum trackwidth of 65% of its wheelbase.

Note- least of the two trackwidths (i.e Front trackwidth and the rear trackwidth) will be taken in consideration and the same must satisfy 65% of wheelbase.

- **5. Ground Clearance-** Vehicle must have a minimum ground clearance of **1.0** inches measured from the lowest part of vehicle.
- **6. Chassis-** Teams should only use seamless pipe with an outer diameter ranging from **1inches** to **2 inches** and with a minimum wall thickness of **1mm**.
- **7. Engine-** Teams should only use engine limited to 135CC
- **8. Transmission** Teams can use any type of transmission
- **9. Steering-** Vehicle must have a mechanical steering
 - There should be an adjustable steering stops at the both extreme left & extreme right turns.
 - Steering system must be mounted rigidly and ergonomically according to the driver's comfort.

- Steering wheel should have a free-play of **3degrees** (minimum) to **7Degrees** (maximum).
- Steering wheel should be a continuous pipe and only 2 types of steering wheels are accepted as shown in the figure below-



There should not be any external covering to the steering wheel during T.I. If the teams are manufacturing their own metal steering wheel then the minimum pipe outer diameter should be 3/4th inch, irrespective of the material type.

10. Braking- Vehicle must have a proper hydraulic brakes installed in it in such a way that while braking at least either of the front or rear two wheels must be locked simultaneously.

Note-Wire actuated braking is strictly prohibited.

- Braking must be purely foot operated.

 No brake linings/hoses should pass under the chassis.
- 11. Pedals- Teams should only use their own-made pedals, use of readymade pedals are strictly prohibited. There should be an adjustable positive and an adjustable negative pedal stop for each individual pedals.
- 12. Tyres size- Teams should only use a standard Go-kart tyre, any type of modifications/Customizations (Re-soling) on tyres prohibited. The age of the tyres should not exceed more than 4 Years counted from Dynamic Event date.
- 13. Chain-guard- There must be a metallic chain guard installed which should cover the top portion of the chain i.e. from drive sprocket to driven sprocket.
- 14. Brake Light- Vehicle must have rear brake light under working condition and the light must be visible from 10 meters away. Brake light will be provided by the organizers.
- 15. Electrical wiring- No wires should go under the chassis and inside the chassis pipe. Wiring should be properly insulated at every nodes/junctions.

- **16. Floor-tray-** A metallic Floortray must be mounted in the vehicle so as to cover the driver's cockpit area. It must also cover the area beneath the seat.
- 17. Bumpers- Vehicle must have two stage rigid front, rear & Side bumpers which can resist the impact and cover all the wheels in such a way that during collision no foreign elements enter into the vehicle. Teams can also use seamed pipes for making the bumpers.

Bumpers should not be bolted to the chassis.

18. Vehicle number identification- Each team will be given a unique vehicle number and the same should be displayed properly on the vehicle in such a way that it must be clearly visible from **10 meters** from all the 4 directions.

Note-The number plate will be provided by the organizers and it must be mounted exactly at the center of all respective bumpers.

19. Pushbar- Vehicle must have a push and pull bar for towing the vehicle.

Vehicle Safety Requirements:

1. Kill Switches- Vehicle must have atleast two kill switches installed in it, in such a way that one should be easily approachable by the driver with in the cockpit and other by the volunteer externally.

The purpose of the kill switch is to deactivate the engine ignition and all other electronic circuits except brake light. Also, kill switches must have a proper tag.

Two kill switches will be provided by the organizers.

2. Fire Extinguishers- Team must have 2 fire extinguishers of **1KG** each out of which 1 must be installed in the vehicle and the other must be carried by the team members.

Two fire extinguishers along with 1 fire extinguisher mounting will be provided by the organizers.

3. Firewall- Vehicle must have a fire and heat proof firewall to protect the driver from the heat/flame from the engine compartment.

4. **Lock Nuts-** It is compulsory to have locknuts/castle nuts-with pin on all wheel bolts, engine mountings, steering system, and all rotating parts of the vehicle as per the safety point of view.

Seat- Teams should use a detachable type of seats

Note- Gokart seat is recommended.

Prizes

Sl.No.	Category
1.	Winner
2.	Runner-Up
3.	Brake Test
4.	Fuel Economy
5.	Skid pad
6.	Best Acceleration
7.	Best Design
8.	Surprise Award

Contact address:

National Highway 95, Chandigarh-Ludhiana Highway, Mohali, Punjab 140413

Phone: 1800 200 0025

Mobile: 9876373267 :9878603384 :7807132576

Website: http://techinvent.cuchd.in/