

Against all Odds !

Against all odds I will survive
despite whatever you're thinking
For I've been through this before
even at times when I've been sinking

Because I've learned many lessons
Earned the hard way and thus I'll say
Before my peers I'm standing tall
because I'm more than ready to play

Against all odds and look at me now
I've been beaten yet finds that hope
A hope that when my days are done
I've found many ways learning to cope

So who's going to speak up right now
telling me that I can't do this or that?
As a testament of perseverance here
let me tell you friend...just where it's at

We are all tested daily and it sure hurts
Nevertheless we must drop our facades
Everyone is capable of being something
Achieving victory when you survive against all odds !

-- Anonymous

To the future Teams & everyone associated with GTM-18

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Formula Student (FS)/FSAE

What is FSAE?

Formula SAE® is a student design competition organized by SAE International (formerly Society of Automotive Engineers). The first competition was started back in 1979 after Mark Marshek, then at University of Houston (Texas) contacted the SAE Educational Relations Department in 1978 to discuss adding a variant event of the Mini Baja; the name Mini Indy was founded. As many organizers have found, the work in building a car can be exceeded only by that to organize the event; 1980 failed to produce an organizer. Having seen the potential of the event, Mike Best, Robert Edwards and John Tellkamp, students at the University of Texas at Austin, approached Dr. Ron Matthews with an idea - how about another Mini-Indy, but with some changes? Make the rules more open; let it be as unlimited as possible. It was desired that this new competition would take the cars to the next level of engineering. The Baja competition was great for chassis design, but many students wanted to work on engines as well. The new rules would keep engine restrictions to a bare minimum. Any four-stroke engine was allowed for the first four years with power limited by a 25.4 mm intake restriction.

With grass roots support from his students, Dr. Ron Matthews contacted the SAE Educational Relations Department and set the wheels in motion. To differentiate this new event from the Mini-Indy, a new name was sought. To reflect better the road-racing nature of the event and its increased engineering content, the Formula SAE name was adopted.

The concept behind Formula SAE is that a fictional manufacturing company has contracted a design team to develop a small Formula-style race car. The prototype race car is to be evaluated for its potential as a production item. The target marketing group for the race car is the non-professional weekend autocross racer. Each student team designs, builds and tests a prototype based on a series of rules whose purpose is both to ensure onsite event operations and promote clever problem solving.

Formula SAE promotes careers and excellence in engineering as it encompasses all aspects of the automotive industry including research, design, manufacturing, testing, developing, marketing, management and finances. Formula SAE takes students out of the classroom and allows them to apply textbook theories to real work experiences.

As a student, taking part in Formula Student gives them the chance to demonstrate their technical, engineering design, and manufacturing skills. They will also learn important lessons on team working, time management, project management, budgeting and presentation: all things that any prospective employer will be looking for. Formula Student graduates also find that the professionalism they gain as practising engineers means they are well equipped for their future engineering careers.

The team is tasked to produce a prototype for a single-seat race car for autocross or sprint racing, and present it to a hypothetical manufacturing firm. The car must be low in cost, easy to maintain, and reliable, with high performance in terms of its acceleration, braking, and handling qualities. During the competition, the team must demonstrate the logic behind their proposal and must be able to demonstrate that it can support a viable business model for both parties.

Today, the competition has expanded and includes a number of spin off events. In the United States, there are two locations: California and Michigan; Michigan being the largest event and longest running.

India and Formula Student:

FSAE/FS started in 1981 in United States of America under the Society of Automobile Engineers. It took 30 years for a team from India to get to that platform and showcase Indian Engineering at such an event. FSAE/FS is all about learning and experiencing what it will be like to work in real world scenario, thus the most important lesson is to learn from yours/others previous mistakes and ensure you do not repeat them. Some of the first teams to be formed in India were:

1. Defianz Racing, Delhi College of Engineering - 2002
2. Ashwa Racing, RCVE, Bangalore - 2005
3. Orion Racing, K. J. Somaiya, Mumbai - 2007
4. Formula Manipal, Manipal University - 2008

By this time there were a few participation from India in various parts of the globe. Till then there was no good show by any Indian team at such a major event. Reasons were still unknown but a lot of teams were to follow the path shown by these few teams. Orion Racing India and Ashwa Racing were making better progress than other teams, but their progress want upto the mark to deliver a car which could compete against the Universities from Germany or USA.

With Consecutive failure of Indian Teams an International Judge, Pat Clarke once posted over FSAE forums; “In a discussion with Steve Fox on how our 1st car will be if we were Indian team, we concluded that we would build a car that would pass all the requirements, would finish all events and would not finish last for just 2000\$. It would not be pretty and it would not have any unoptanium or unavailabilium on it. It would roll on street wheels and Tires but it would ROLL!!!!”.

This was the start of a new Era with students now having an inspiration and a goal for how the 1st car should actually be. On the other end an affiliate body to SAE International, namely SAEINDIA after the successful start of SAE India BAJA, started their discussion on having an Indian Version of the International FSAE Competition under the Name ‘SUPRA (Super Racing) SAE INDIA’. After a couple of meetings and discussions on frame work, safety and flow of the event, hard work of Prof. Sudhir Gupte & SAE India President Mr. M. S. Kumar first ever Indian Formula Collegiate Series Competition took shape. The 1st Virtual SUPRA was organized in 2009, where 28 teams participated final race event was held at Madras Motorsports Race Track, Chennai in 2011. The event was not totally compliant to the International Rules but served as a good platform for young teams to get in. Supra SAEINDIA was highly criticized for being unsafe and uneducated because of its framework and not meeting up the standards of other FSAE/FS events internationally. Here was where Indian ‘Jugaad Engineering’ was challenged to be converted into ‘pure engineering’. Some took the ownership to perform better and started working on the same but on the other end No. of teams rose up exponentially and the same issues continued. No successful car yet.

After nearly 10 years, in 2011, the team IIT Roorkee Motorsports developed a car and represented India in FSAE Australasia 2011 competition held in Melbourne, Australia and

became the first ever car from India to complete the 22 km endurance race, The team also stood 1st in Efficiency.

Over the years there were some good engineered cars going to international events like UK, Germany & Italy. Teams like Orion Racing, Pravega racing, Formula Manipal, Raftar Formula racing, etc raised the Indian flag internationally. Pravega Racing, Vellore was the first team to grab awards at an international event. 3rd in Manufacturing and Cost Event, FS Italy-2012, 2nd in Manufacturing and Cost Event, FS Italy-2013. This was just the beginning, students of India hope to see a podium finish by an Indian team soon in the near future. In, 2017, the 1st season of FORMULA BHARAT with 73 teams from across India took place at Kari Motor Speedway, Coimbatore in the month of January. Seeing the concern issues with Supra SAEINDIA the international competition (FSAE/FS) was also introduced to India under the name Formula Bharat (FB). The event followed the strict norms of international rulebook and proved to be a good learning experience to teams which could not travel to these foreign destinations. After US, India is the second country to have two such events happening in a year.

In July 2017, the 6th edition of SUPRA SAEINDIA 2017 was held at Buddh International Circuit, Noida from 26th June to 1st July where 126 teams from various engineering colleges from all over India had participated. 111 teams had registered onsite with their vehicles to participate in the event. Team GT Motorsports, the Formula Student Team of GTU emerged as the National Champions of year 2017 by winning this event and bagging several other awards in different categories. In January 2018, the second edition of Formula Bharat was held at Kari Motor Speedway, Coimbatore from 24th – 28th January 2018 with 74 teams from universities across India came together to compete against each to get the title of National Champions.

The Team:

GT Motorsports - Formula Student Team GTU is a state level collaboration between 13 colleges spread across Gujarat state. These colleges share physical and intellectual resources by using advanced communication-technology to create a highly competitive vehicle. The supply chain management is unique in Formula Student and very important at that point.

Team Structure:

Because the GT Motorsports Team is a co-operation of many colleges it needs an efficient organization structure behind it. Rather than act as competitors at the events, resources are pooled and the skills of the colleges combined. Design, production and testing will take place at various campuses. GT Motorsports is divided into teams including: Management, Powertrain, Body, Aerodynamic and Suspension. These Teams are split again in different sub-teams. These sub teams are visualized in the graph.

For this type of collaboration, it is imperative that each sub team involve students from varied interests and use all the human resources available to meet design and manufacture deadlines. Image shows how the Team Structure was formed.

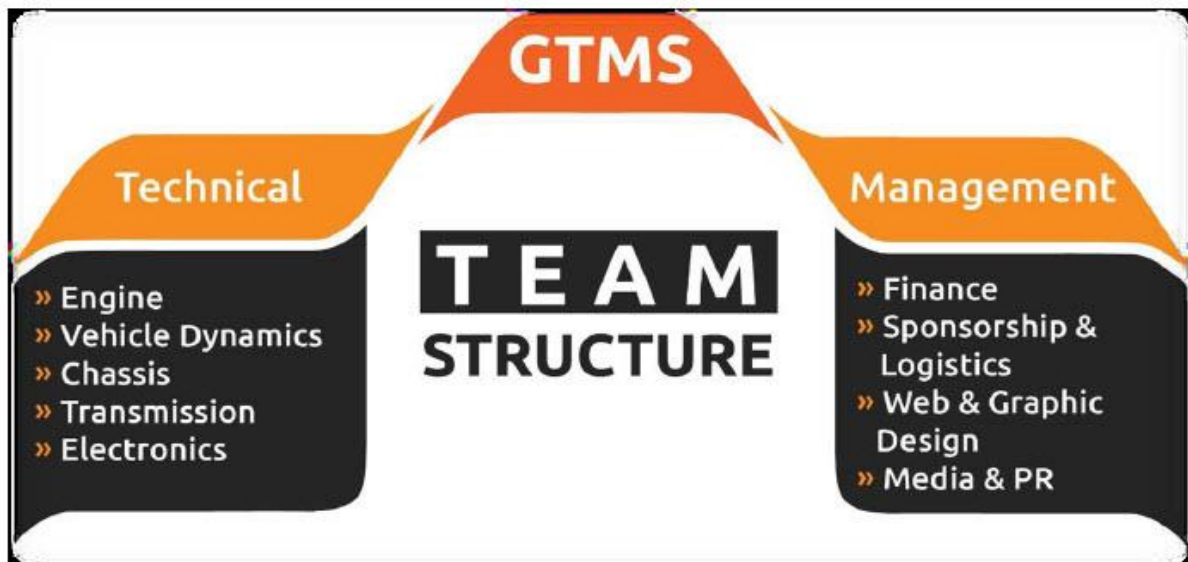


Image 01: Team Structure

Team List:

Sr.No	Name	College Name	Branch
1	Singh Aditya Amar	A. D. Patel Institute Of Technology	Automobile
2	Sunil Kumar	Ahmedabad Institute Of Technology	Electrical
3	Patel Bhuman Jitendrakumar	Ahmedabad Institute of Technology	Mechanical
4	Edwin Jiji	Ahmedabad Institute Of Technology	Mechanical
5	Agrawal Chinitan Rajendra	L. D. College of Engineering	Automobile
6	Bhavsar Ketan Pramod	L. D. College of Engineering	Automobile
7	Parmar Unmit Ishvarbhai	L. D. College of Engineering	Automobile
8	Panchal Kushal Jayeshkumar	L. D. College of Engineering	Automobile
9	Thakkar Kishan Hiteshkumar	L. D. College of Engineering	Automobile
10	Hirani Sarthak Jayeshbhai	L. J. Institute Of Engineering & Technology	Mechanical
11	Solanki Ankit Vinesh	L. J. Institute Of Engineering & Technology	Automobile
12	Bhatt Harsh Kamlesh	S. P. B. Patel Engineering College	Mechanical
13	Dubey Luvneesh Sitaram	S. P. B. Patel Engineering College	Mechanical
14	Patel Prashant Bharatbhai	Sal Institute of Tech & Engg Research	Automobile
15	Patel Vishal Mukesh	Sal Institute of Tech & Engg Research	Automobile
16	Patel Tirth Mineshkumar	Shree Saraswati Edu. Sansthan Group of Institution	Mechanical
17	Kuksal Abhishek Rajesh	Silver Oak College Of Engineering & Technology	Mechanical
18	Poojara Yash Nehalbhai	Silver Oak College Of Engineering & Technology	Mechanical
19	Kadam Neeraj Vikrant	Silver Oak College Of Engineering & Technology	Mechanical
20	Chettiar Sanjay Suresh	Sal College Of Engineering	Mechanical
21	Panchal Keyur Bhupendrabhai	Vishwakarma Government Engineering College	Mechanical
22	Pathak Krutarth Manojkumar	Vishwakarma Government Engineering College	Mechanical

Main Event: Formula Bharat 2018

Kari Motor Speedway, Coimbatore, Tamil Nadu:

Date: 24th January, 2018 (Day-0)

The team members reached the event site as per the schedule that they received, to register themselves. The on-site registration process began at 8.30 am. The team had reached a day prior to the beginning of the event as they team had to face the PreTech on Day-0 itself, so it was necessary to prepare the car before that. Whilst the registration process began the team members started working on getting the vehicle ready to take it to the allotted pit. Soon the registration process began and the team captain and one of the team member registered the team and collected the Kit (event schedule, event handbook, wristbands, driver bands and I-cards) provided by the event organizers. In the meantime, the rest of the members were busy working to get the vehicle on wheels to take it to the pit. 22 team members of GT Motorsports registered at the event site. After the registration was done the team was allotted a pit (according to the team categorization), wherein the team was supposed to setup their car and the required tools. Everyone onsite was busy helping their respective teams to set up their car and the pit as well as taking a tour of the track. 71 teams had registered for Formula Bharat 2018 by clearing the Rulebook Quiz. Once the pit was setup with the car and the tools inside the pit, the team started working on the car as they had to face Pre-Tech on Day 0 itself. The team has to take the vehicle to their assigned pre-tech bay and necessary preparations were done accordingly. The vehicle was taken to the inspection bay at around 11:00 AM. The judge inspected the car and suggested few minor changes in the car and some useful tips before the car goes for Technical Inspection on the next day.



Image 02: Kari Motor Speedway Main Track



Image 03: GTM18 being taken to the pit

Seeing the work done on the car and the neatness of the car, the Pre-Tech judge promoted the team from Tier 2 team to Tier 1 team category. Also, the team was awarded with the name of most prepared team for the technical inspection. As Kari Motor Speedway lies in the outskirts of Coimbatore, far away from a residential area, the team members had given the responsibility of taking care of their accommodation, travel and food to My Pit Crew. My Pit Crew arranged rooms for all the 22 members in a hotel in Coimbatore city and provided the team with a private bus for their transportation from hotel to track and track to hotel.

Date: 25th January, 2018 (Day-1)

Day 1; 9:00 AM and the team was ready with the vehicle for technical inspection. Also, the technical inspection bays were declared open for all the teams who were ready with their car to undergo technical inspection, which is the first test that every team has to clear before it moves on to the next test. The team members nominated for the technical inspection prepared themselves for the discussion and went to the assigned bay with the vehicle. The other members started preparing for the coming static and dynamic events. The technical inspection went smoothly with only minor changes instructed to be made.

Problems pointed out during the first attempt:

- The steering play was well over the limits mentioned in the rulebook.
- The air intake manifold has to be mounted rigidly.
- Change the filler neck tube as the current setup is not leak proof.

Solutions to the problem:

- The UV joint in the steering column was adjusted.
- The filler neck tube was changed as per the instructions.
- Rigid mounting points were assigned to the intake manifold.



Image 04: First Attempt at Technical Inspection

The Business Event of the team was scheduled on Day 1 itself at 11:00 AM at the Business presentation bay. The Business Event of all the teams was scheduled to take place on that day itself. Here in, a few team members have to present a proposal, in front of a panel of judges to lure the investors to invest in them in order to start the production of their car on large scale. Two members of GTMS had appeared in front of the panel of judges and presented their Business case. The business event got over at 11:30 AM. The judges were impressed by the presentation and appreciated the team's preparedness. At the same time the team went for the second attempt of the technical inspection. The inspection que was now longer than before therefore the team has to wait for their turn.

Also, on Day 1 two seminars were arranged by the organizers for all the teams present at the event site. The first seminar was undertaken by Pat Clarke, who was one of the lead design judge of Formula Bharat 2017. In his seminar, he talked about his experiences with various Indian Formula Student teams, how they build their team, how they build their car and how they perform in an international event. He threw some light on the basic problems faced by each team in designing a Formula Student vehicle and gave some useful tips to build a well-engineered car. The second seminar was undertaken by Claude Rouelle (President, Optimum G) who also was one of the lead design judge. In his seminar, he gave some tips and guidelines on Vehicle Dynamics and how to make a lighter and more compact car. This seminar proved to be very

useful for all the teams present there because this was the major problem faced by most of the Indian teams. Day 1 ended with a Welcome Ceremony by the organizers to welcome all the teams, participants, volunteers, judges who took part in the event.

Date: 26th January, 2017 (Day-2)

The team continued working on the problems identified on Day 1 by the technical inspection judge and later during the day, the team appeared for the technical inspection again. The amendments done to the problems were identified on Day 1 were checked and few other rulebook violations were pointed out by the judge.



Image 05: Second Attempt at Technical Inspection

Problems pointed out on Day-2:

- Still existing steering play.
- Wire clamp for attaching the filler neck to the fuel tank was not satisfactory.
- Loose hose clamps for the overflow bottle hoses.
- Fix clearance for the clutch cable.
- Insert sleeve over the spacers for AIP plate mount.

Solutions of the problem:

- The UV joint for the steering column was replaced.

- Wire clamps were replaced.
- Hose clamps were replaced.
- Clutch cable wire was replaced.
- Sleeve was inserted.

Cost Event:

The Cost Event of the team took place in the allotted pit on Day-2. Team GTMS presented their cost to the judges of the event along with the unique features of their car like newly purchased Ohlins Dampers and customized Radiator which helped them in increasing the performance of the car along with optimizing the features as per their requirements. Further after the presentation of the cost by the students it was now the turn of the judges to check if the participants have considered all the minute cost details of the car. Details as precise as cost of U-Bolts used to mount the body panels, to the cable ties used to pack the wires together were asked for in the cost event. The cost explanation file was produced before the judges for the assigned sub system (the suspension system). One of the member from the cost team posed the explanation to various manufacturing processes of the part and assembly of the vehicle while other posed the relevant data. Overall the team's report was appreciated for the following features of the cost report.

1. Completeness of the BOM
2. Cost Understanding
3. Lucid explanation for the manufacturing processes
4. Cost prediction for production
5. Accuracy and realism of the cost generated
6. Data provided in the Cost Supporting document.



Image 06: Team at Cost Event

After the Cost Event it was time for the team to take their car to the Design Bay for the Design Event. In the design event, the motive is to check the knowledge of the students

about the design of the car. In the design event, the evaluation of the designing knowledge of members of the team was evaluated and later the feedback was provided to the team, where they need to focus for further improvement of the car. Also, the team successfully cleared the Technical inspection in the third attempt. The technical inspection sticker was attached to the vehicle indicating an access to other static and dynamic events.



Image 07: Team at Design Event

Design Event:

The design event was scheduled at 4:00 PM in the evening. During the design event, entire team members of GTMS were called on the Design Event Bay so that each member can participate in this event and gain knowledge designing. The design evaluation process was led by Claude Rouelle, who paid more focus to the dynamic aspects of the car. The design of GTM 18 impressed every judge and gathered many words of praise. Detailed explanation was proposed to the judges for critical assemblies and design decisions. Here also the judges appreciated the data presented to them by the design team.

The vehicle was then taken to the tilt test. But some false adjustments led to a leak from the fuel tank resulting a failure to clear the test in the very first attempt. The vehicle was returned to the pit for making the necessary fix. The time for the day was up then and the team has to return to the hotel. The team before leaving to the hotel made all the changes to the vehicle.

Date: 27th January, 2017 (Day-3)

The day started when the team went for the tilt test. 10:30 AM and the vehicle cleared the tilt test, where the car was mounted on a tilt table and the harness was tightened around the Main Roll hoop of the car so as to prevent car in case of roll over, and the car was tilted at 45 deg and then 60 deg from the horizontal and the car was checked for leaks. Now the team went for the Noise test. The car moved on to the Noise Testing Area for the Noise Test where in, the

engine is fired and noise level of the car @7500rpm is measured. The noise in any scenario should not exceed 110db. The vehicle was cranked for the first time on the event site. All other static and dynamic events were already running parallelly. The team cleared the noise test at around 2:00 PM and went for the brake test. The brake test was cleared in the third attempt. The time was 3:00 PM and the dynamic event sets were to be closed by 5:00 PM. So it was on the team to decide one form the Acceleration, Skidpad and the Autocross event. Due to lack of sufficient time the team was not able to participate in the dynamic events Acceleration and Skidpad event. But the team performed substantially well in the autocross event. Day 3 ended as the team returned to the pit



Image 08: Technical Inspection Sticker on GTM18



Image 09: GTM18 at Tilt Test



Image 10: GTM18 with all its Stickers

At the end of Day-3, the GTM17 successfully cleared all its tests but unfortunately couldn't take part in any of the Dynamic Events. After all the dynamic events were over the Design Finals began in which all the top teams in the Design Event go their car reviewed by the Design Judges.

Date: 28th January, 2017 (Day-4)

It was the final day of the event and the team was all set and ready with the car to participate in the Endurance Race, which was scheduled to start at 10:00 AM. Before the endurance began, a track walk was scheduled for all the drivers who were going to drive in the Endurance, so that the drivers would get an idea about the track on which they were going to drive. The teams which did not take part in any Dynamic Events were given the first preference in the lineup for the Endurance race. The GTM18 was the 8th car in the lineup for Endurance. The Endurance race comprises of a 22km race among different cars with the track being restricted to some 6ft and to check the driver's capabilities various hurdles in form of Zig-Zag pattern were designed in the race. Each team is supposed to complete 22km run on the track in order to successfully complete the Endurance Race. Along with that, teams are supposed to get their driver changed after completion of 11km.

GTM18 made a great start to the race and were going smooth and clean during the entire race. With some great driving skills of the drivers of GTM18, the team managed to complete half of the Endurance race with No Breakdown and leakage. The next half didn't went as planned as the vehicle didn't started after the driver change. The problem was instantaneous and could not be rectified onsite then. Unfortunately, the vehicle has to be returned to the pit and the team received DNF for not completing the Endurance race.

Post Endurance, the GTM18 was taken to the Parc Ferme for Post Endurance Inspection where all the 6 cars that completed the Endurance were inspected by the judges. After clearing the Post Endurance Inspection, the GTM18 was taken back to the pit from where along with all the other tools and package it was taken to the truck to send it back to

its home. A prize distribution ceremony was organized in the end for all the teams that bagged the top positions in all the events. Team GT Motorsports ranked 10th overall amongst all the 71 teams from all over India that were present at the event site.



Image 11: Driver 1 in position



Image 12: Endurance Driver 1



Image 13: GTM18 at Parc Ferme



Image 14: GTM18 cleared Post Endurance inspection



Image 15: GTM18 at weight scales



Image 16: GTM18 being loaded into truck

Lessons Learnt:

1. Do not listen to people who say you can't do it.
2. A Motivated team can overcome highest bureaucracy.
3. Don't Stick with Plan A for the event site. Consider Contingencies and Keep a backup plan ready for possible Breakdowns.
4. Stay Updated with the rulebook. There can be slight changes in the rules each time and can cause serious damage.
5. Hard work always pays off. Don't lose hope till the last moment.
6. Keep the whole team intact. Stay in touch with senior members and carry along the juniors with you.
7. Documentation. Each and every minute details should be documented and maintained well be it Design Decisions, Fabrication, Marketing or Management.
8. Focus evenly towards Static Events along with the Dynamic events. They can cause a huge difference in overall Standings. This is an Engineering Design Event and not a Motor Racing Event. Focus more on learning than Competing.
9. Practice makes a Machine Perfect. Test the Vehicle in similar track conditions. All failures must happen in the testing phase only. More Testing will give you more data for improvements.
10. Segregate the Cost Report into multiple parts and mark the Key Components for easy access during the presentation.
11. Dedicate few Students for Static Events well in advance. They are Cash points no matter how your car is you can score maximum in this.
12. Don't get carried away. Follow protocols strictly and ensure safety.
13. Every part including the last NUT & BOLT must be modelled in CAD.
14. Launch Event must be decided a month in Advance. Proper management to be ensure by the team. Don't miss out on any detail. Invitations to be sent in person and follow up should be taken.
15. "Straight Trees are cut first". Avoid Bureaucracy of any level and authority. You might have a good intention but it can go other ways and shoot against you.

Proposed Suggestions for Future Years:

1. A Separate Joint A/C should be opened which is to be operated by three people. 1) Treasurer of the team. 2) Team Faculty Advisor. (Who will be able to understand the necessity and urgency of the required item) 3) Official from GTU. (So even GTU can keep a live time track on where the money is going)
2. Codify a process to import goods. Any Pro Forma Invoice from a company abroad is valid for 2 weeks. It takes over two weeks to get approval for purchase according to current Procedure.
3. Proper allocation of workspace to team members. To have a permanent place with proper facilities boost the morale of the team working on a project. Same is the problem with Workshop. A working workshop will be really helpful for the team to get best out of their team members. Separate allocation of budget or prior talk to host institute must be done for the same.
4. The team must be given access to a proper working Fabrication Lab which has modern equipment like MIG/TIG Welding, Bench Drills, Alignment Bench, Basic CNC facilities like Turning & VMC.
5. A Dedicated Computer Lab for the Team with PC Configurations matching the modern needs of CAD & CAE Software. Students don't have such high end setups with them.
6. The team is ready for participating in an international event. The preparations for the same should be done.

Appendix – 1: Team List

Team Number	Team Name	Institution Name
1	Orion Racing India	K. J. Somaiya College of Engineering
2	DJS Racing	D.J. Sanghvi College of Engineering
3	Team Srijan	Birla Institute of Technology, Mesra
4	Raftar Formula Racing	IIT Madras
5	Team Nequit	Rajarambapu Institute of Technology
6	Formula Manipal	Manipal University
7	Team Revolution	D Y Patil School of Engineering Academy AMBI
8	GVA Motorsports	G.V.Acharya Institute of Engineering and Technology
9	Team Octane Racing	College Of Engineering, Pune
10	Team MH-08 Racing	Rajendra Mane College of Engineering and Technology
11	Ashwa Racing	R.V. College Of Engineering
12	Amrita Racing	Amrita School of Engineering
13	Inspired Karters	BITS Pilani
14	Camber Racing	SRM University
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering
16	Team Unwired	National Institute of Technology Calicut
17	Atraiu Racing	Hindustan Institute of Technology and Science
18	Manab Racing	Haldia Institute of Technology
19	Team Lakshya	Chitkara University
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune
21	GT Motorsports	Gujarat Technological University
22	Force Ikshvaku	The National Institute of Engineering, Mysuru
24	Aious Formula Student	Indira Gandhi Delhi Technical University for Women
25	Ethan Racing	Vidyavardhini's College of Engineering and Technology
26	Formula Nitte	NMAM Institute of Technology
27	Kreinto Racing	K L University
28	Team Vamos Autocross	Sinhgad Academy of Engineering, Kondhwa(Bk),Pune
29	Veerracerss	Veer Surendra Sai University Of Technology
30	Wrench Welders Racing	Symbiosis Institute of Technology, Pune
31	DIT Motoracing	DIT University
32	Force Racing	KITS Warangal
34	Optimum Racing	Pillai HOC College of Engineering and Technology
36	AeroX Motorsports	SRM University, NCR CAMPUS
38	Team Defianz Racing	Delhi Technological University
39	Redline Racing	JSPM's Rajarshi Shahu College OF Engineering
40	CRCE Formula Racing	Fr. Conceicao Rodrigues College of Engineering
41	IITK Motorsports	Indian Institute of Technology Kanpur
42	Team Haya Racing	PES University
44	Pegasus Racing	PSG College of Technology
45	SPCE Racing	Sardar Patel College Of Engineering
46	Shaurya Racing	VIT Chennai

47	Hermes Racing	KIIT University
48	Team Accelerons	NIT Kurukshetra
49	Infinity Motorsport	Amity School of Engineering
51	Team Racing Nemos	Madras Institute of Technology
53	GEU Motorsports	Graphic Era University
54	Automantra Racing	Galgotias University
55	Team iShell	Chandigarh University
56	Team BrahMos Racing	Nagesh Karajagi Orchid College Of Engineering & Technology
57	Max Torque Racing	Acharya Institute of Technology
58	Team Ojaswat	Chandubhai S. Patel Institute of Technology, CHARUSAT
59	Vaayu	MGM'S Jawaharlal Nehru Engineering College
60	Bullethawk Racing	Netaji Subhas Institute of Technology
61	Formula Sahyadri	Sahyadri College of Engineering and Management
62	Resonance Racing	AISSMS College of Engineering
63	Fast and Furious Motorsports	Veltech Multitech Dr.RR & Dr.SR Engineering College
65	Cool Runnings	Manav Rachna International University
66	Team Traxion	Sri Venkateswara College of Engineering
67	Team Roadrunner	National Institute of Technology, Rourkela
68	The Metal Falcons	D Y Patil College Of Engineering
69	Team Sakthi Racing	Kumaraguru College of Technology
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology
71	Formula Team Pegasus	PES Modern College Of Engineering

Appendix – 2: Event Results

Design Event Result

Car #	Team Name	Institution Name	FINAL SCORE - DESIGN	RANK
2	DJS Racing	D.J. Sanghvi College of Engineering	150	1
1	Orion Racing India	K. J. Somaiya College of Engineering	143	2
38	Team Defianz Racing	Delhi Technological University	135	3
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	127	4
14	Camber Racing	SRM University	120	5
3	Team Srijan	Birla Institute of Technology, Mesra	115	6
4	Raftar Formula Racing	IIT Madras	115	6
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	115	6
9	Team Octane Racing	College Of Engineering, Pune	110	7
21	GT Motorsports	Gujarat Technological University	110	7
11	Ashwa Racing	R.V. College Of Engineering	105	8
13	Inspired Karters	BITS Pilani	105	8
44	Pegasus Racing	PSG College of Technology	105	8
45	SPCE Racing	Sardar Patel College Of Engineering	105	8
41	IITK Motorsports	Indian Institute of Technology Kanpur	100	9
46	Shaurya Racing	VIT Chennai	100	9
68	The Metal Falcons	D Y Patil College Of Engineering	100	9
67	Team Roadrunner	National Institute of Technology, Rourkela	90	10
42	Team Haya Racing	PES University	85	11
7	Team Revolution	D Y Patil School of Engineering Academy AMBI	80	12
31	DIT Motoracing	DIT University	75	13
36	AeroX Motorsports	SRM University, NCR CAMPUS	75	13
40	CRCE Formula Racing	Fr. Conceicao Rodrigues College of Engineering	75	13
8	GVA Motorsports	G.V.Acharya Institute of Engineering and Technology	70	14
12	Amrita Racing	Amrita School of Engineering	70	14
27	Kreinto Racing	K L University	70	14
47	Hermes Racing	KIIT University	70	14
56	Team BrahMos Racing	Nagesh Karajagi Orchid College Of Engineering & Technology	70	14
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	70	14
19	Team Lakshya	Chitkara University	60	15

29	Veerracerss	Veer Surendra Sai University Of Technology	60	15
39	Redline Racing	JSPM's Rajarshi Shahu College OF Engineering	60	15
48	Team Accelerons	NIT Kurukshetra	60	15
66	Team Traxion	Sri Venkateswara College of Engineering	60	15
5	Team Nequit	Rajarambapu Institute of Technology	55	16
49	Infinity Motorsport	Amity School of Engineering	55	16
53	GEU Motorsports	Graphic Era University	50	17
59	Vaayu	MGM'S Jawaharlal Nehru Engineering College	45	18
17	Atraiu Racing	Hindustan Institute of Technology and Science	40	19
25	Ethan Racing	Vidyavardhini's College of Engineering and Technology	40	19
16	Team Unwired	National Institute of Technology Calicut	30	20
24	Aious Formula Student	Indira Gandhi Delhi Technical University for Women	30	20
55	Team iShell	Chandigarh University	30	20
58	Team Ojaswat	Chandubhai S. Patel Institute of Technology, CHARUSAT	30	20
18	Manab Racing	Haldia Institute of Technology	20	21
22	Force Ikshvaku	The National Institute of Engineering, Mysuru	20	21
51	Team Racing Nemos	Madras Institute of Technology	10	22
54	Automantra Racing	Galgotias University	10	22
28	Team Vamos Autocross	Sinhgad Academy of Engineering, Kondhwa(Bk),Pune	0	23
63	Fast and Furious Motorsports	Veltech Multitech Dr.RR & Dr.SR Engineering College	0	23
65	Cool Runnings	Manav Rachna International University	0	23
57	Max Torque Racing	Acharya Institute of Technology	0	24
62	Resonance Racing	AISSMS College of Engineering	0	24
69	Team Sakthi Racing	Kumaraguru College of Technology	0	24
71	Formula Team Pegasus	PES Modern College Of Engineering	0	24

Cost Event

Car #	Team Name	Institution Name	FINAL SCORE (100)	RANK
2	DJS Racing	D.J. Sanghvi College of Engineering	94.50	1
38	Team Defianz Racing	Delhi Technological University	88.00	2
11	Ashwa Racing	R.V. College Of Engineering	86.00	3
47	Hermes Racing	KIIT University	76.00	4
9	Team Octane Racing	College Of Engineering, Pune	75.00	5
1	Orion Racing India	K. J. Somaiya College of Engineering	74.00	6
4	Raftar Formula Racing	IIT Madras	73.00	7
21	GT Motorsports	Gujarat Technological University	68.00	8
46	Shaurya Racing	VIT Chennai	67.00	9
3	Team Srijan	Birla Institute of Technology, Mesra	67.00	9
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	63.00	11
48	Team Accelerons	NIT Kurukshetra	60.50	12
8	GVA Motorsports	G.V.Acharya Institute of Engineering and Technology	60.00	13
25	Ethan Racing	Vidyavardhini's College of Engineering and Technology	59.50	14
28	Team Vamos Autocross	Sinhgad Academy of Engineering, Kondhwa(Bk),Pune	59.00	15
13	Inspired Karters	BITS Pilani	58.50	16
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	56.00	17
19	Team Lakshya	Chitkara University	55.00	18
31	DIT Motoracing	DIT University	51.50	19
40	CRCE Formula Racing	Fr. Conceicao Rodrigues College of Engineering	51.50	19
66	Team Traxion	Sri Venkateswara College of Engineering	48.50	21
39	Redline Racing	JSPM's Rajarshi Shahu College OF Engineering	43.00	22
42	Team Haya Racing	PES University	39.00	23
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	39.00	23

29	Veerracerss	Veer Surendra Sai University Of Technology	38.50	25
12	Amrita Racing	Amrita School of Engineering	37.50	26
67	Team Roadrunner	National Institute of Technology, Rourkela	37.00	27
51	Team Racing Nemos	Madras Institute of Technology	35.00	28
41	IITK Motorsports	Indian Institute of Technology Kanpur	32.50	29
54	Automantra Racing	Galgotias University	32.00	30
56	Team BrahMos Racing	Nagesh Karajagi Orchid College Of Engineering & Technology	31.00	31
44	Pegasus Racing	PSG College of Technology	30.00	32
53	GEU Motorsports	Graphic Era University	30.00	32
24	Aious Formula Student	Indira Gandhi Delhi Technical University for Women	28.00	34
36	AeroX Motorsports	SRM University, NCR CAMPUS	28.00	34
58	Team Ojaswat	Chandubhai S. Patel Institute of Technology, CHARUSAT	28.00	34
59	Vaayu	MGM'S Jawaharlal Nehru Engineering College	28.00	34
27	Kreinto Racing	K L University	26.00	38
18	Manab Racing	Haldia Institute of Technology	25.00	39
22	Force Ikshvaku	The National Institute of Engineering, Mysuru	24.00	40
14	Camber Racing	SRM University	23.50	41
45	SPCE Racing	Sardar Patel College Of Engineering	22.00	42
71	Formula Team Pegasus	PES Modern College Of Engineering	21.50	43
5	Team Nequit	Rajarambapu Institute of Technology	20.00	44
69	Team Sakthi Racing	Kumaraguru College of Technology	18.00	45
65	Cool Runnings	Manav Rachna International University	15.00	46
55	Team iShell	Chandigarh University	12.00	47
17	Atraiu Racing	Hindustan Institute of Technology and Science	12.00	47
49	Infinity Motorsport	Amity School of Engineering and Technology	11.00	49
7	Team Revolution	D Y Patil School of Engineering Academy AMBI	10.00	50
68	The Metal Falcons	D Y Patil College Of Engineering	6.00	51

16	Team Unwired	National Institute of Technology Calicut	2.00	52
57	Max Torque Racing	Acharya Institute of Technology	0.00	53
62	Resonance Racing	AISSMS College of Engineering	0.00	53
63	Fast and Furious Motorsports	Veltech Multitech Dr.RR & Dr.SR Engineering College	0.00	53

Business Plan Presentation

Car #	Team Name	Institution Name	Final Score (75)	RANK
3	Team Srijan	Birla Institute of Technology, Mesra	75	1
11	Ashwa Racing	R.V. College Of Engineering	73.5	2
38	Team Defianz Racing	Delhi Technological University	73	3
1	Orion Racing India	K. J. Somaiya College of Engineering	71	4
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	64.94	5
41	IITK Motorsports	Indian Institute of Technology Kanpur	64.52	6
13	Inspired Karters	BITS Pilani	64.1	7
53	GEU Motorsports	Graphic Era University	64.1	7
21	GT Motorsports	Gujarat Technological University	63.67	9
16	Team Unwired	National Institute of Technology Calicut	63.25	10
62	Resonance Racing	AISSMS College of Engineering	63.25	10
9	Team Octane Racing	College Of Engineering, Pune	62.41	12
14	Camber Racing	SRM University	60	13
46	Shaurya Racing	VIT Chennai	58.61	14
8	GVA Motorsports	G.V.Acharya Institute of Engineering and Technology	58.19	15
28	Team Vamos Autocross	Sinhgad Academy of Engineering, Kondhwa(Bk),Pune	53.55	16
25	Ethan Racing	Vidyavardhini's College of Engineering and Technology	53.34	17
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	52.71	18
66	Team Traxion	Sri Venkateswara College of Engineering	49.76	19
54	Automantra Racing	Galgotias University	46.39	20
5	Team Nequit	Rajarambapu Institute of Technology	45.96	21
48	Team Accelerons	NIT Kurukshetra	45.54	22
51	Team Racing Nemos	Madras Institute of Technology	45.54	22
45	SPCE Racing	Sardar Patel College Of Engineering	45.12	24
18	Manab Racing	Haldia Institute of Technology	44.7	25
42	Team Haya Racing	PES University	44.07	26
2	DJS Racing	D.J. Sanghvi College of Engineering	43.86	27
36	AeroX Motorsports	SRM University, NCR CAMPUS	43.43	28
22	Force Ikshvaku	The National Institute of Engineering, Mysuru	43.01	29
67	Team Roadrunner	National Institute of Technology, Rourkela	42.59	30

4	Raftar Formula Racing	IIT Madras	42.17	31
57	Max Torque Racing	Acharya Institute of Technology	41.54	32
24	Aious Formula Student	Indira Gandhi Delhi Technical University for Women	39.01	33
12	Amrita Racing	Amrita School of Engineering	36.69	34
27	Kreinto Racing	K L University	35	35
47	Hermes Racing	KIIT University	35	35
56	Team BrahMos Racing	Nagesh Karajagi Orchid College Of Engineering & Technology	35	35
44	Pegasus Racing	PSG College of Technology	33.52	38
7	Team Revolution	D Y Patil School of Engineering Academy AMBI	30.36	39
55	Team iShell	Chandigarh University	29.73	40
59	Vaayu	MGM'S Jawaharlal Nehru Engineering College	28.67	41
68	The Metal Falcons	D Y Patil College Of Engineering	28.67	41
40	CRCE Formula Racing	Fr. Conceicao Rodrigues College of Engineering	25.09	43
17	Atraiu Racing	Hindustan Institute of Technology and Science	24.46	44
19	Team Lakshya	Chitkara University	20.66	45
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	18.98	46
29	Veerracerss	Veer Surendra Sai University Of Technology	17.71	47
58	Team Ojaswat	Chandubhai S. Patel Institute of Technology, CHARUSAT	17.29	48
49	Infinity Motorsport	Amity School of Engineering and Technology	17.08	49
71	Formula Team Pegasus	PES Modern College Of Engineering	15.81	50
65	Cool Runnings	Manav Rachna International University	14.34	51
39	Redline Racing	JSPM's Rajarshi Shahu College OF Engineering	13.49	52
63	Fast and Furious Motorsports	Veltech Multitech Dr.RR & Dr.SR Engineering College	12.65	53
31	DIT Motoracing	DIT University	8.43	54
69	Team Sakthi Racing	Kumaraguru College of Technology	0	55

Acceleration:

Car #	Team Name	Institute Name	Final Score (75)	Rank
11	Ashwa Racing	R.V. College of Engineering	75.00	1
70	The Interceptors	Dr. D.Y. Patil Institute of Technology	68.17	2
1	Orion Racing India	K.J. Somaiya College of Engineering	63.29	3
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	59.49	4
20	Stallion Motorsport S3.0	Smt. Kashibhai Navale College of Engineering Pune	26.96	5
2	DJS Racing	D.J. Sanghvi College of Engineering	18.50	6

The team was not able to participate in Acceleration Event as, by the time they were done clearing all the tests the time slot for which the Acceleration track was open had ended.

Skidpad Event:

Car #	Team Name	Institute Name	Final Score (75)	RANK
2	DJS Racing	D.J. Sanghvi College of Engineering	75	1
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	61.05	2
20	Stallion Motorsport S3.0	Smt. Kashibhai Navale College of Engineering Pune	36.27	3
11	Ashwa Racing	R.V. College of Engineering	35.88	4
1	Orion Racing India	K.J. Somaiya College of Engineering	3.5	5

The team was not able to participate in Acceleration Event as, by the time they were done clearing all the tests the time slot for which the Acceleration track was open had ended.

Autocross Event:

Car#	Team Name	Institute Name	Final Score (100)	RANK
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	100.00	1
38	Team Defianz Racing	Delhi Technological University	82.60	2
1	Orion Racing India	K. J. Somaiya College of Engineering	76.56	3
4	Raftar Formula Racing	IIT Madras	75.92	4
9	Team Octane Racing	College Of Engineering, Pune	43.40	5
21	GT Motorsports	Gujarat Technological University	35.64	6
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	29.22	7
2	DJS Racing	D.J. Sanghvi College of Engineering	61.78	8
11	Ashwa Racing	R.V. College Of Engineering	26.72	9
14	Camber Racing	SRM University	17.78	10
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	12.82	11
46	Shaurya Racing	VIT Chennai	4.50	12

Endurance Event:

Car #	Team Name	Institute Name	Final Score (325)	RANK
1	Orion Racing India	K. J. Somaiya College of Engineering	325	1
4	Raftar Formula Racing	IIT Madras	305	2
38	Team Defianz Racing	Delhi Technological University	268	3
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	205	4
2	DJS Racing	D.J. Sanghvi College of Engineering	163	5
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	117	6
5	Team Nequit	Rajarambapu Institute of Technology	25	7
48	Team Accelerons	NIT Kurukshetra	25	7
9	Team Octane Racing	College Of Engineering, Pune	0	-
11	Ashwa Racing	R.V. College Of Engineering	0	-
14	Camber Racing	SRM University	0	-
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	0	-
21	GT Motorsports	Gujarat Technological University	0	-
22	Force Ikshvaku	The National Institute of Engineering, Mysuru	0	-
45	SPCE Racing	Sardar Patel College Of Engineering	0	-
46	Shaurya Racing	VIT Chennai	0	-

Overall Rankings:

Car #	Team Name	Institution Name	Total Points	Overall Ranking
1	Orion Racing India	K. J. Somaiya College of Engineering	834.15	1
38	Team Defianz Racing	Delhi Technological University	729.39	2
4	Raftar Formula Racing	IIT Madras	711.05	3
2	DJS Racing	D.J. Sanghvi College of Engineering	691.68	4
20	Stallion Motorsport S3.0	Smt. Kashibai Navale College of Engineering Pune	533.28	5
15	Team Kratos Racing	Pimpri Chinchwad College of Engineering	444.26	6
70	The Interceptors	Dr. D.Y. Patil Institute Of Technology	413.76	7
11	Ashwa Racing	R.V. College Of Engineering	402.1	8
9	Team Octane Racing	College Of Engineering, Pune	290.81	9
21	GT Motorsports	Gujarat Technological University	277.32	10
3	Team Srijan	Birla Institute of Technology, Mesra	257	11
46	Shaurya Racing	VIT Chennai	230.11	12
13	Inspired Karters	BITS Pilani	227.6	13
14	Camber Racing	SRM University	221.28	14
41	IITK Motorsports	Indian Institute of Technology Kanpur	197.02	15
48	Team Accelerons	NIT Kurukshetra	191.04	16
8	GVA Motorsports	G.V.Acharya Institute of Engineering and Technology	188.19	17
42	Team Haya Racing	PES University	188.07	18
45	SPCE Racing	Sardar Patel College Of Engineering	172.12	19
66	Team Traxion	Sri Venkateswara College of Engineering	158.26	20
53	GEU Motorsports	Graphic Era University	154.1	21
25	Ethan Racing	Vidyavardhini's College of Engineering and Technology	152.84	22
44	Pegasus Racing	PSG College of Technology	148.52	23
36	AeroX Motorsports	SRM University, NCR CAMPUS	146.43	24
5	Team Nequit	Rajarambapu Institute of Technology	145.96	25
12	Amrita Racing	Amrita School of Engineering	144.19	26
40	CRCE Formula Racing	Fr. Conceicao Rodrigues College of Engineering	141.59	27
47	Hermes Racing	KIIT University	141	28
56	Team BrahMos Racing	Nagesh Karajagi Orchid College Of Engineering & Technology	136	29
31	DIT Motoracing	DIT University	134.93	30
68	The Metal Falcons	D Y Patil College Of Engineering	134.67	31
27	Kreinto Racing	K L University	131	32
19	Team Lakshya	Chitkara University	120.66	33
7	Team Revolution	D Y Patil School of Engineering Academy AMBI	120.36	34

39	Redline Racing	JSPM's Rajarshi Shahu College OF Engineering	116.49	35
29	Veerracerss	Veer Surendra Sai University Of Technology	116.21	36
67	Team Roadrunner	National Institute of Technology, Rourkela	114.59	37
28	Team Vamos Autocross	Sinhgad Academy of Engineering, Kondhwa(Bk),Pune	112.55	38
59	Vaayu	MGM'S Jawaharlal Nehru Engineering College	101.67	39
24	Aious Formula Student	Indira Gandhi Delhi Technical University for Women	97.01	40
16	Team Unwired	National Institute of Technology Calicut	95.25	41
51	Team Racing Nemos	Madras Institute of Technology	90.54	42
18	Manab Racing	Haldia Institute of Technology	89.7	43
22	Force Ikshvaku	The National Institute of Engineering, Mysuru	87.01	44
17	Atraiu Racing	Hindustan Institute of Technology and Science	76.46	45
58	Team Ojaswat	Chandubhai S. Patel Institute of Technology, CHARUSAT	75.29	46
55	Team iShell	Chandigarh University	71.73	47
49	Infinity Motorsport	Amity School of Engineering and Technology	63.08	48
54	Automantra Racing	Galgotias University	53.39	49
57	Max Torque Racing	Acharya Institute of Technology	46.04	50
65	Cool Runnings	Manav Rachna International University	29.34	51
71	Formula Team Pegasus	PES Modern College Of Engineering	27.31	52
69	Team Sakthi Racing	Kumaraguru College of Technology	18	53
62	Resonance Racing	AISSMS College of Engineering	12.75	54
63	Fast and Furious Motorsports	Veltech Multitech Dr.RR & Dr.SR Engineering College	0	55