



**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**

**DEPARTMENT OF MECHANICAL ENGINEERING**

## **Go Kart Designing and Fabrication**



### **Chassis Design and Fabrication in College Workshop:**





## Visit by HOD, ME.





## Mounting of Engine, Seat and Steering:





## Mounting of Brake and its assembly:





## Testing of Go Kart:







**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2018-19**

## **National Go Kart Racing Championship 2k18 (NGRC)**

### **Venue of event**

NGRC, Bhopal, MP

### **Date of event**

10 to 13 September 2018

### **Venue for Fabrication of Go Kart**

Priyadarshini College of Engineering, Nagpur. (Workshop)

### **Award Received:**

**1. 2<sup>nd</sup> position in Skip Pad Test**



**Award received by Team Speed Wagon**









## NATIONAL GO KART RACING CHAMPIONSHIP 2K18

10 SEP 2018 - 13 SEP 2018

SR. NO.	NAME OF STUDENT	SEM/SEC	ROLL. NO.
1	VIKRAM FARFAD	7C	359
2	AMAN GODBOLE	5B	205
3	ANIKET ZADE	5C	309
4	DEWASHISH DHOKE	5C	315
5	KETAN JUMNAKE	5C	319
6	MANISH CHANDURKAR	5C	322
7	MAYUR NAGPURE	5C	323
8	MUKUL KALE	5C	324
9	ROSHAN BONDE	5C	331
10	SACHIN GAJBHIYE	5C	333
11	SAURABH SATPUTE	5C	336
12	SUMIT GHORPADE	5C	340
13	YOGESH SURESH DHADSE	5C	346
14	ANIKET BARAPATRE	5C	349
15	MANMOHAN JHAM	5D	409
16	MUKESH P. KAPSE	5D	414
17	MAYUR KHIRATKAR	3A	121
18	NITESH VIBHUTE	3A	125
19	OMKAR SHADANGULE	3A	126
20	PRATIK KHOBRAGADE	3A	133
21	SANGHARSH GAIKWAD	3A	146
22	SAURABH YENKIE	3A	149
23	SHUBHAM KITUKALE	3A	153
24	TANMAY AGNIHOTRI	3A	160





**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2018-19**  
**Student Cart Design Challenge 2K18 (SKDC)**

**Venue of event**

SKDC, Hyderabad

**Date of event**

17 to 20 September 2018

**Venue for Fabrication of Go Kart**

Priyadarshini College of Engineering, Nagpur. (Workshop)

**Award Received:**

**1. Best Ergonomics**

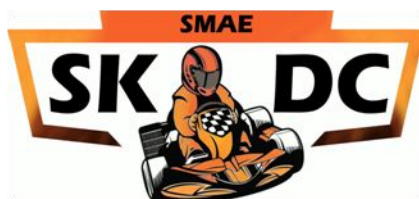


**Team with Technical Inspection Squad**









## STUDENT CART DESIGN CHALLENGE 2K18

17 SEP 2018 - 20 SEP 2018

SR. NO.	NAME OF STUDENT	SEM/SEC	ROLL. NO.
1	GULSHAN SAWARKAR	7th C	319
2	SHASHANK HEDAU	7th C	350
3	ABHISHEK BHANDARKAR	7th C	302
4	PRATIK BISNE	7th C	331
5	PRANIT VAIRAGADE	7th C	329
6	ADITYA DHAGE	7th C	304
7	YASH MALIYE	7th C	360
8	NIKHIL CHOUDHARI	7th C	323
9	SURAJ K. GAJBHIYE	7th D	425
10	SAURABH SAMRIT	7th D	435
11	RUSHIKESH KHADSE	7th D	419
12	VISHAKH ULEMALE	7th B	202
13	CHANDRABHUSHAN MAHANKAL	7th B	250
14	SARVESH BUKKAWAR	7th C	348
15	BHUSHAN JOSHI	7th B	229
16	BHAVESH DALVI	5th C	352
17	AKASH KAWALE	5th C	305
18	PRATIK KAWADE	5th D	419
19	PRASHANT BHUSEWAR	5th D	417
20	ABHIJEET BHANSE	5th D	434



## STUDENTS KART DESIGN CHALLENGE SEASON 2



EVENT	TEAM
CHAMPION	TEAM DYNAMIC BOOSTER
RUNNER UP	TEAM PISTON BREAKERS
ENDURANCE AND FUEL ECONOMY WINNER	TEAM PISTON BREAKERS
ENDURANCE AND FUEL ECONOMY RUNNER UP	TEAM IRONKNIGHTS
BEST DESIGN	TEAM KARTKNIGHTS
SKID PAD	TEAM INVADER RACING
SPEED SNAP	TEAM MECKARTRONZ
AUTOCROSS	TEAM KARTKNIGHTS
DIS-ASSEMBLY & ASSEMBLY	TEAM DYNAMIC BOOSTER
LOW WEIGHT	TEAM SUPER IGNITE
E-PLAN	TEAM EQUINOX
AESTHETICS	TEAM ACRUX
BEST INNOVATION	TEAM RUDRA
BEST ERGONOMICS	TEAM SPEEDWAGON
SPIRIT OF THE EVENT	TEAM RACING WARRIORS
STAR RACER OF THE DAY	NIRANJANA-TEAM MECKARTANS

**Congratulations to all the winners of SKDC Season 2 –  
at Hyderabad.**





**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2017-18**

**International Series of Karting (ISK)**

**Venue of event**

ISK 2018, Vishakhapattanam

**Date of event**

21th, 22nd and 23rd of February 2018

**Venue for Fabrication of Go Kart**

Priyadarshini College of Engineering, Nagpur. (Workshop)

**Award Received:**

**1. Technically Sound Kart (Team award)**



**Award received by Mr. Gulshan Sawarkar**

## 2. Best Maneuverability (Driver award)



Award received by Mr. Vishakh Ulemale

### What Teams Get From ISK

ISK participating teams have strong, flexible and top notch **skills**.

Management	Engineering	Other
Team Management	Design	Team Spirit
Time Management	Manufacturing	Sportsmanship
Financial Management	Quality Inspection	Memories



## Series of Events that are held in ISK



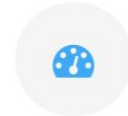
### TECNICAL INSPECTION

Scrutiny of Kart to check if it is according to ISK rules or not



### DESIGN EVALUATION

Design approach and Design reports are evaluated during design evaluation



### Brake Test And Acceleration

Brake test to check proper working of brake and Acceleration test the straight line acceleration of Kart



### SKIDPAD And MANEUVERABILITY

Steering ability and maneuverability of Kart is tested



### Qualifying, Quartfinals And Semifinals

The races start after qualifying



### FINAL RACE

Top teams from semifinals race for grand finale





**GO-KART ISK VISAKKAPATNAM 2018**  
**26 Feb 2018 - 3 Mar 2018**

**Participant list**

<b>SR. NO.</b>	<b>NAME OF STUDENT</b>	<b>SEM/S EC</b>	<b>ROLL. NO.</b>
1	ANKET PATIL	6A	107
2	PUSHPAK UMARE	6A	130
3	JAWAHAR REWATKAR	6A	133
4	PRATIK SATPUTE	6A	142
5	SAURABH DONGRE	6A	148
6	MOHIT SAHU	6A	156
7	HIMANSHU KUMBHARE	6 B	201
8	VISHAKH ULEMALE	6 B	204
9	SOHAM RAKHDE	6 B	214
10	BHUSHAN JOSHI	6 B	217
11	CHANDRABHUSHAN MAHANKAL	6 B	228
12	GUNJAN BOKADE	6 B	236
13	SAURABH SAMRIT	6 C	317
14	ADITYA DHAGE	6 C	326
15	GULSHAN SAWARKAR	6 C	333
16	PRANIT VAIRAGADE	6 C	347
17	ABHISHEK BHANDARKAR	6 C	354
18	SHASHANK HEDAU	6 C	359
19	ABHIJEET BHANSE	4 D	410
20	PRASHANT BHUSEWAR	4 D	412
21	BHAVESH DALVI	4 D	418
22	SURAJ GAJBHIYE	6 D	419
23	PRATIK KAWADE	4 D	436
24	AKASH KAWALE	4 D	437





**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2017-18**  
**Zeal Drag 2.0**

**Venue of event**

Zeal Drag 2.0, Pune, MS

**Date of event**

22 to 26 March 2018

**Venue for Fabrication of Go Kart**

Priyadarshini College of Engineering, Nagpur. (Workshop)

**Award Received:**

**1. Best Sportsmanship**



**Award received by Mr. Suraj Gajbhiye, Mr. Gulshan Sawarkar, Mr. Samrit, Mr. Pratik, Mr. Shashank**









**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2015-16**

**Department Organized : MECHANICAL DEPARTMENT.**

**Participated By:** - All Faculty & Students of Mechanical Engineering Department

**Event:** - SAE Installation.

**Purpose:** - To enhance the knowledge of student in the automobile sector by forming a professional body SAE.

**Dignitaries:** Dr. M. P. Singh (Principal PCE), Dr. K. S. Zakiuddin (HOD, ME), Dr. R. S. Kadu , Mr. Pratap Shinde (M&M, Nagpur) , Prof. Prashant Kadu.

**Date:** 15 Sep 2015

**No of Students:** - 50



**SAE Installation Ceremony**

**REMARK/CONCLUSION:**

1. The SAE Professional Body was formally installed successfully.
2. Aim, Goal, Vision & Plans of the Body were discussed, including but not limited to organizing events, & all- round development of students in the automobile field.



**Team BAJA Participated at Indore**





**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**  
**DEPARTMENT OF MECHANICAL ENGINEERING**



**2014-15**

**Department Organized : PCE SAEINDIA Collegiate Club Dept. Of Mechanical Engineering.**

**Participated By: - All Faculty & Students of Mechanical Engineering Department**

**Event: - SAE Installation.**

**Purpose: - To enhance the knowledge of student in the automobile sector by forming a professional body SAE.**

**Dignitaries: Dr. M. P. Singh (Principal PCE), Dr. K. S. Zakiuddin (HOD, ME), Prof. Prashant Kadu.**

**Date: 26/07/2014**

**No of Students: - 55**



**REMARK/CONCLUSION:**

1. The SAE Professional Body was formally installed successfully.
2. Aim, Goal, Vision & Plans of the Body were discussed, including but not limited to organizing events, & all- round development of students in the automobile field.

**Department Organized :** PCE SAEINDIA Collegiate Club Dept. Of Mechanical Engineering.**Participated By:** - Faculty & Students of Mechanical Engineering Department

**Event:** - Industrial Visit at Arun Automobile

**Purpose:** - To get the practical Knowledge on automobile Components

**Date:** 02/09/2015

**No of Students:** - 15



**Remark:-**

This visit was helpful for getting the practical knowledge about two wheeler and its troubleshooting.



**Organized by :** PCE SAEINDIA Collegiate Club Dept. Of Mechanical Engineering.

**Participated By:** - All Faculty & Students of Mechanical Engineering Department

**Event:** - Industrial Visit Khamla Automobile Pvt. Ltd.

**Purpose:** - To get awareness about the components used in automobile and hands on experience.

**Date:** 09/08/2014

**No of Students:** -10



**Remark:-**

This visit was helpful for students to increase their practical knowledge of automobile components and its applications.

**Organized by :** PCE SAEINDIA Collegiate Club Dept. Of Mechanical Engineering.

**Participated By:** - Faculty & Students of Mechanical Engineering Department

**Event:** -Guest Lecture

**Expert :-** Mr. Sahul Chivande MD, Geometric Technology.

**Purpose:** - To make students conversant with the latest opportunities in CAD/CAM/CAE Solution

**Dignitaries:** Dr. K. S. Zakiuddin (HOD, ME), Prof. P. S. Kadu, (Mr. Sahul Chivande MD, Geometric Technology)

**Date:-** 24/02/ 2015

**No of Students:** - 100



**REMARK/CONCLUSION:**

This seminar was informative and very useful for the students to enhance the knowledge about the latest opportunities in the field of CAD/CAM/CAE .



DEPARTMENT OF MECHANICAL ENGINEERING  
**PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**

**2013-14**

**REPORT ON SUPRA**

**Held at KIIT, Bhubaneswar, 20<sup>th</sup>-21<sup>st</sup> September**

It was a very remarkable and unforgettable move in the academic history of SAEINDIA PCE COLLEGIATE CLUB when students from our college routed towards KIIT, Bhubaneswar where the virtual round of SAEINDIA SUPRA was to be held.

SUPRA is a competition organized by SAEINDIA for undergraduate and postgraduate students where the task is to design and fabricate a formula style car.

SAEINDIA P.C.E COLLEGIATE CLUB was formed on 14<sup>th</sup> March, 2013 and its start banded on the technical platform when the first team PCE VIPERS qualified its Virtuals of the event named BAJA 2013-14 held at Sri Venkateshwar College of Engineering and Technology, Bangalore on 28<sup>th</sup> September, 2013 where the task was to design and fabricate an All Terrain Vehicle.

Finally that inspired a large hub of students from our college and they got eager and vigilant to participate in SUPRA 2013-14. And those 40 marched to the seminar hall of Mechanical Department on 16<sup>th</sup> June, 2013 under the guidance of Prof. Prashant S. Kadu, Faculty Advisor of SAEINDIA P.C.E COLLEGIATE CLUB.



**Professor Prashant S. Kadu introducing students to SUPRA 2013-14**

Presentations were taken on the topic “Why to participate in SUPRA?”



And after screening 21 students were selected .

And a team of 21 students was formed comprising of 2nd and 3<sup>rd</sup> year students from the Departments of Mechanical and Aeronautical Engineering.

The team was named VEYRON inspired by Bugatti Veyron, world’s fastest car.

The admin panel of the team was as follows:

<b>Faculty Advisor</b>	<i>Professor Prashant S. Kadu</i>
<b>Team Captain</b>	<i>Akash Deep</i>
<b>Vice-Captain</b>	<i>Abhijit Khedkar</i>



<b>Co-ordinator</b>	<i>Arpit Deshmukh</i>
<b>Accounts In charge</b>	<i>Shajid Sabbir Khan</i>
<b>Media &amp; Web In charge</b>	<i>Kundan Kumar Singh</i>
<b>Documentation</b>	<i>Intiyas Khan</i>
<b>Travel Manager</b>	<i>Alok Raj</i>

- **Step-1: Team Selection & Formation on 16<sup>th</sup> June, 2013**

The complete team was as follows:

### **Team Veyron**

<b>FACULTY ADVISOR - Professor Prashant S. Kadu</b>			
<b>NAME</b>	<b>BRANCH</b>	<b>TECHNICAL POST</b>	<b>MANAGERIAL POST</b>
Akash Deep	MECH	<u>POWERTRAIN</u>	TEAM CAPTAIN
Satyabrat Borgohain	MECH	<u>POWERTRAIN HEAD</u>	R & D
Alok Raj	MECH	<u>POWERTRAIN</u>	TRAVEL MANAGER
Intiyas Khan	MECH	<u>POWERTRAIN</u>	DOCUMENTATION
Mayank Dash	MECH	<u>POWERTRAIN</u>	MANAGEMENT
Bhavya Agrawal	MECH	<u>BRAKES, WHEELS &amp; TIRES HEAD</u>	PUBLICITY
Shubhangi Chaudhari	MECH	<u>BRAKES, WHEELS &amp; TIRES</u>	PUBLICITY
Shajid Shabbir Khan	MECH	<u>BRAKES, WHEELS &amp; TIRES</u>	PUBLICITY
Arpit Deshmukh	MECH	<u>BRAKES, WHEELS &amp; TIRES</u>	CO-ORDINATOR
Saurabh Deshmukh	AERO	<u>DESIGNING HEAD</u>	MANAGEMENT
Kundan Kumar Singh	MECH	<u>DESIGNING</u>	WEB MANAGER
Nakul Mahalle	MECH	<u>DESIGNING</u>	TECHNICAL HEAD
Ariz Nishat	MECH	<u>DESIGNING</u>	SPONSORSHIP
Snehal Mankar	MECH	<u>DESIGNING</u>	SPONSORSHIP
Aman Marbate	AERO	<u>ASSEMBLY HEAD</u>	SPONSORSHIP
Laxmi Donode	MECH	<u>ASSEMBLY HEAD</u>	SPONSORSHIP
Raihan Ahmed	MECH	<u>STEERING &amp; SUSPENSION HEAD</u>	SPONSORSHIP
Abhijit Khedkar	MECH	<u>STEERING &amp; SUSPENSION</u>	VICE CAPTAIN
Nilesh Raut	MECH	<u>STEERING &amp; SUSPENSION</u>	TECHNICAL HEAD
Rana Mondal	MECH	<u>STEERING &amp; SUSPENSION</u>	BACKUP
Om Prakash Tiwari	ELECT	<u>ELECTRICAL HEAD</u>	BACKUP

- **Step-2: Registration of 21 member's team**



Total Registration Cost: Rs.16854

Per student charge : Rs.802

ALLAHABAD बैंक BOKARO STEEL CITY  
ALLAHABAD BANK जारी कर्ता शाखा ISSUING BRANCH

कूट सं. CODE No. 0210533 दिनांक / Date 15/07/2013

मांगे जाने पर ON DEMAND PAY SAEINDIA

रुपये RUPEES Sixteen Thousand Eight Hundred and \*\*16854.00

प्राप्त मूल्य के लिये अदा करें FOR VALUE RECEIVED

NOT OVER Rs.16854/-

इलाहाबाद बैंक  
ALLAHABAD BANK

अधिकृत हस्ताक्षरकर्ता AUTHORIZED SIGNATORY

मामूला हस्ता. सं. सहित WITH SPECIMEN SIG. NUMBER

Tel No.: 06542-240257

7 18499 0000 100000

The registration money was collected and the required registration demand draft was sent to SUPRA Headquarters for our team registration.

Responding to our proposal they sent us the confirmation mail which certified our team for the event.

Aakash Deep <aakashdeep957@gmail.com>

Dear Captains & Team Members,

Greetings from SUPRA SAEINDIA 2014!

It gives me a immense pleasure to invite all the registered teams for participation in SUPRA SAEINDIA 2014 event which will be the first of its kind With FS Rules in India. This will take place at MMRT (Madras Motor Race Track), of Madras Motor Sports Club (MMSC), Irungattukottai , Chennai, in July 2014

We had enormous response from all of you and the total number of teams registered before the due date is 157. We have plans to place the names of teams, their colleges, contact email ID for each team on our website shortly. We are still in the process of scrutinizing the hard copies of form received from each of the teams having registered. Some of the teams have not provided some or the other information or may found to be wrong as per requirement will be



intimated within a week. You are requested to furnish the missing information, supporting documents & DD's before 5<sup>th</sup> August' 2013.

Rule book is been uploaded on the website. In the mean time you are required to search for various Designing & analysis software available. Assess the capabilities and limitations of that software and learn to use the software (you finalize). Develop proficiency and start working on various design options.

As we need to conduct the Workshop for detailed discussions on Rule book and awareness for the registered teams in each section, colleges interested in conducting the workshop are requested to come forward and reply to Mr. B .Dinesh, Manager CDS Programs SAEINDIA, at [dinesh@saeindia.org](mailto:dinesh@saeindia.org).

The Virtual event for short listing the Final Teams is forecast to be conducted in the Month of September 2013 from 19<sup>th</sup> to 21<sup>st</sup> @ KIIT Bhubaneswar, Odissa. We Request all the teams for their participation in VIRTUAL SUPRA SAEINDIA 2013.

Request all the teams to make arrangements for travel accordingly, it is required that all the teams arrive on 19<sup>th</sup> September Night by latest and plan to leave not before 21<sup>st</sup> September late night as the results for the Virtual will be announced on the 21<sup>st</sup> Evening during the Valedictory Function.

I welcome all the teams for their participation in SUPRA SAEINDIA 2014 and wish you all the best for success on behalf of organizing committee.

Happy Learning.

Thanks and regards.

Dr. S. Thirumalini

Head - Mechanical Engineering, Amrita School of Engineering

Convener, SUPRA SAEINDIA 2014

Chair Engineering Education Board - SAEINDIA

Dinesh.B

Manager, CDS Programs Development

#1/17 Ceebros Arcade | 2nd Floor | 3rd Cross | Kasturba Nagar | Adyar |  
Chennai - 600 020 | Mobile : +91 9791035888 | Ph: +91 44 24411904, 42152280  
| [www.saeindia.org](http://www.saeindia.org)

- ***Step-3: Planning and Task Initialization***





- *Step-4 :Identification of goals*

- SUBDIVISION OF TEAM INTO RESPECTIVE DEPARTMENTS

NAME	BRANCH	TECHNICAL POST
Akash Deep	MECH	<u>POWERTRAIN</u>
Satyabrat		
Borgohain	MECH	<u>POWERTRAIN HEAD</u>
Alok Raj	MECH	<u>POWERTRAIN</u>
Intiyas Khan	MECH	<u>POWERTRAIN</u>
Mayank Dash	MECH	<u>POWERTRAIN</u>
Bhavya Agrawal		<u>BRAKES,WHEELS &amp;</u>
	MECH	<u>TIRES HEAD</u>
Shubhangi		<u>BRAKES,WHEELS &amp;</u>
Chaudhari	MECH	<u>TIRES</u>
Shajid Shabbir		<u>BRAKES,WHEELS &amp;</u>
Khan	MECH	<u>TIRES</u>
Arpit Deshmukh		<u>BRAKES,WHEELS &amp;</u>
	MECH	<u>TIRES</u>
Saurabh		
Deshmukh	AERO	<u>DESIGNING HEAD</u>
Ariz Nishat	MECH	<u>DESIGNING</u>
Snehal Mankar	MECH	<u>DESIGNING</u>
Aman Marbate	AERO	<u>ASSEMBLY HEAD</u>
Laxmi Donode	MECH	<u>ASSEMBLY</u>
Raihan Ahmed		<u>STEERING &amp;</u>
	MECH	<u>SUSPENSION HEAD</u>
Abhijit Khedkar		<u>STEERING &amp;</u>
	MECH	<u>SUSPENSION</u>
Rana Mondal	MECH	<u>STEERING &amp;</u>

## SUSPENSION

MANAGERIAL WORK ALSO STARTED IN PARALLEL WITH TECHNICAL

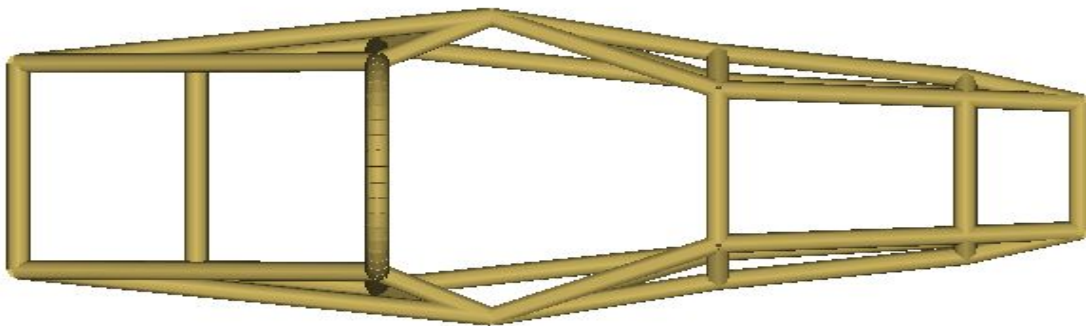
The presentation content code was very simple. The presentation Contents:

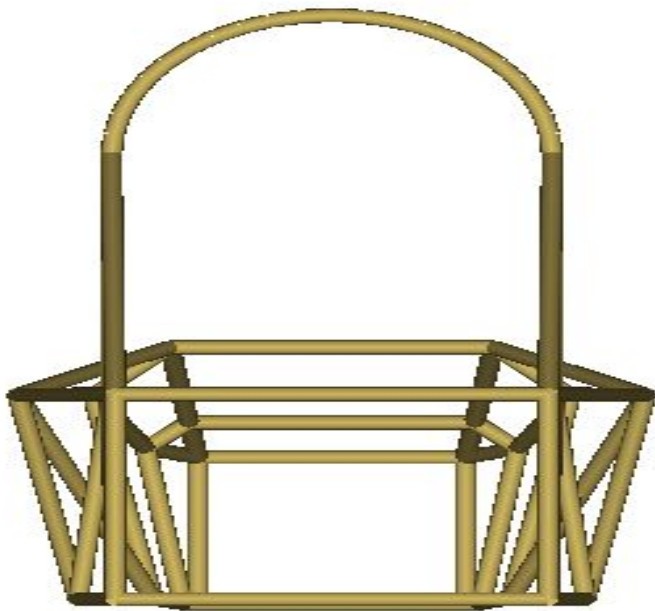
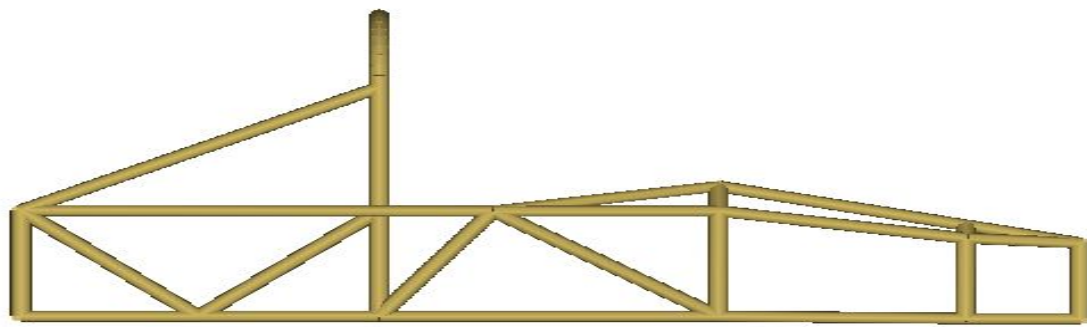
- What was done in previous seminar?
- What was the review of previous seminar?
- What were the suggestions and queries in previous seminar?
- What were the answers to queries in previous seminar?
- What references had you taken
- Today's topics and focus
- Data
- Tables
- Bar Charts
- Pie Charts
- Calculations
- Diagrams
- Final module, design and specification
- Why these specifications and data?
- What are the benefits?
- What are the differences in your and previous designs?
- Videos
- Interpretation Report of those videos.
- References
- Books referred
- Research papers and their reviews
- Faculty Members who helped
- Further plans and steps
- Thanks, gratitude and acknowledgement to helpers and team





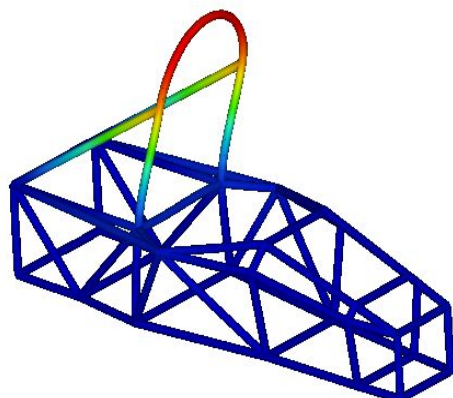
***Step-5: PRELIMINARY DRAWINGS AND SKETCHES WERE PREPARED FOLLOWING THE APPROACH OF CONCURENT ENGINEERING and ADVANCEMENT IN CAD MODELLING & TECHNICAL CALCULATIONS***



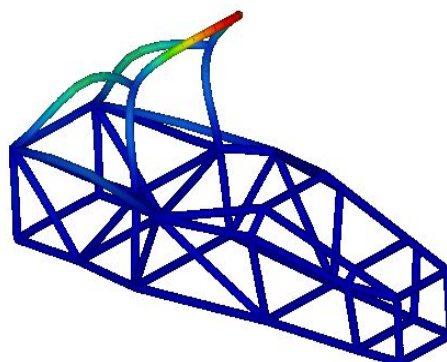


**STEP 6 : ANALYSIS OF DESIGN AND ITS FEASIBILITY**  
**STEP 7:SUBMISSION OF PRELIMINARY DESIGN REPORTS**

SUBCASE 1 : Mode#1, Frequency= 4.161e+001Hz  
 Frame 181 : Angle 360.000000



SUBCASE 1 : Mode#2, Frequency= 9.090e+001Hz  
 Frame 181 : Angle 360.000000





- 
- ***STEP 8: SUSPENSION, WHEEL AND BRAKING, POWERTRAIN WORK***

# POWERTRAIN

Manufacturer	Kawasaki (Ninja)
Model	EX500R (chain drive)
General Features	4-stroke, 8 valve, inline, twin cylinder DOHC, LIQUID Cooled,
Displacement	498 cc
Maximum Output (Power)	43.7 KW @ 9800 RPM
Maximum Torque	46 N-m @ 4500 RPM
Bore x Stroke	75 x 58 mm
Compression Ratio	10.8 :1
Ignition Type	Digital advance/electric
Weight	54 Kgs



GEAR	GEARBOX RATIO	OVERALL RATIO
1st	3.583	15.586
2nd	2.166	9.422
3rd	1.333	5.798
4th	0.900	3.915
Reverse	3.363	3.915

## Maruti F8B Gearbox

**Final Drive Ratio** - 4.350

**Type** - Manual

**Differential type** - Straight Bevel Gear

**Clutch type** - Dry, Single Plate

**No. of gears** - 4 Forward, 1 Reverse

## SUSPENSION

**Wishbone suspension type**

**unequal length**

**double A-arm design**

**Coil over shocks**

**preferred over gas shocks**

**Alternatives considered:-**

*Mc-Pherson strut*

*Swing axle suspension*

**Correct valving and spring rate**

**Easily available and fits in constraining parameters.**

**Double Wishbone**

**1. Mc-Pherson**



**2. Swing Axle**

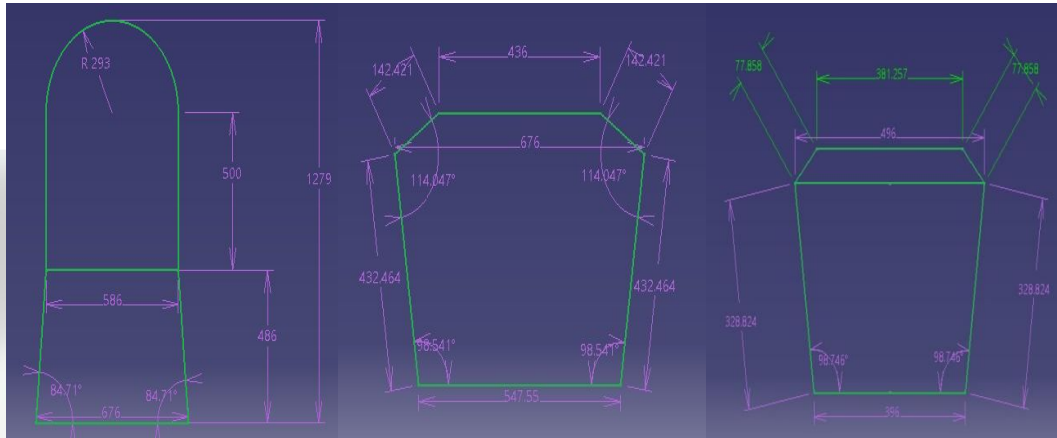
**SPRING**

**SPECIFICATIONS**

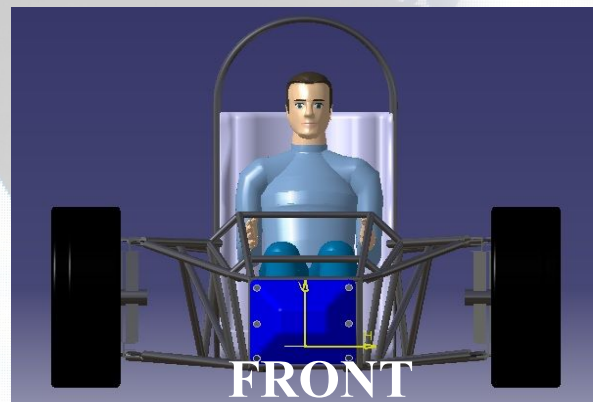
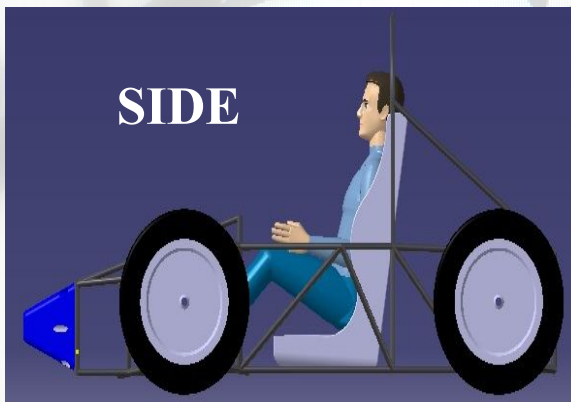
PARAMETER	UNITS
Wire diameter	15mm
Core diameter	60mm
Travel	60mm
Spring Rate	17.05 N/mm



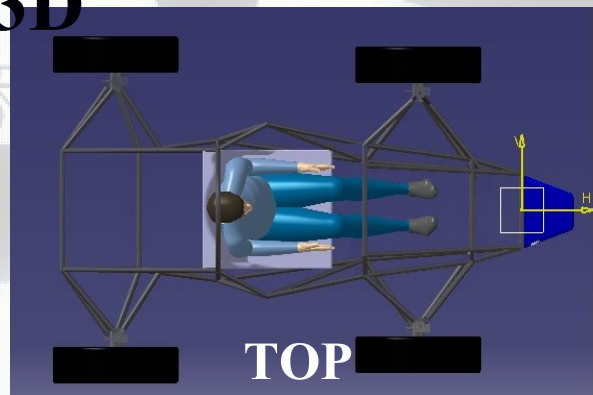
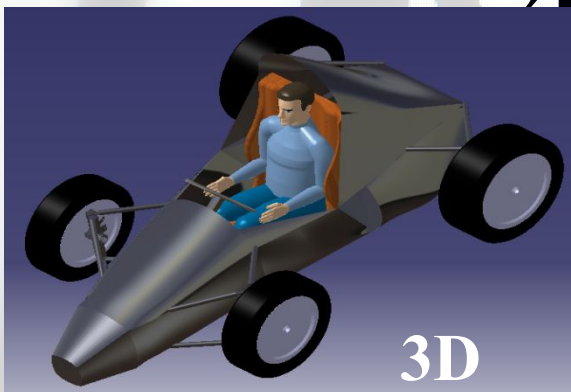
- **STEP 9: COMPLETION OF ROLL CAGE**



- **STEP 10: VEHICLE ERGONOMICS AND AESTHETICS**



2D/3D











- ***STEP 11: PVC Modeling and vehicle prototyping***











**Presentation in front of a Jury panel comprising of 5 judges from SAEINDIA.**







**Question and Answer Session on dismantling of engine, shocks dampers, costing**



### **SAEINDIA-P.C.E COLLEGIATE CLUB**



**DEPARTMENT OF MECHANICAL ENGINEERING  
PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR**

## **Introduction**

SAEINDIA is the leading resource for mobility for technology. As an individual member driven society of mobility practitioners the ownership of SAEINDIA rests with its member who are individuals from the mobility community, which includes engineer's executive from industry, Government officials, Academics and Students.

SAEINDIA is an affiliate society of SAE international registered in India as an Indian nonprofit engineering and scientific society dedicated to the advancement of mobility industry in India. The founding principle of the SAE international is to unite scientific and technical staff to perform free academic discussions, to dedicate themselves to



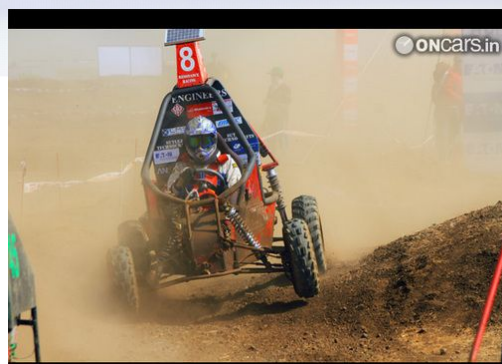
the cause of prospering the science and technology for automotive vehicles and to make contribution to speed up the modernization of automotive industry.

A great deal of effort has been expended to make these definitions suit this purpose. It is recognized quite well by both SAEINDIA and SAE International which keeps on raising its bar on standards since like linguistic dictionaries even our efforts and purpose must be revised periodically to reflect current usage and changing needs.

For the vibrant Indian automotive industry double digit growth in all segments is required as India is fast emerging as hub for global vehicle programs. Vision 2020 is of making auto industry a turnover of USD 113 billion For this vision a huge market capture and respect of IPR (Intellectual Property Rights) is necessary, growth in engineering and IT capability for Designing and manufacturing is required, opportunity to partner in product and process innovation should evolve.



## Challenges – Typical of a high growth emerging market





The stiff competition faced by automotive industry in India are due to factors of Infrastructure challenges like Roads , Ports, Power etc. ,Inflation in economy, Unavailability of skilled manpower, less managerial depth across tiers, lack of R&D competence and above all in raising capital and scaling capacities.

## BAJA – A Boon for Indian Automotive Industry

The main objective of BAJA SAE (Society for Automotive Engineers) competition is to stimulate real-world engineering challenges in front of young Automobile engineering students, wherein they are tasked to plan, design, fabricate and engineer a single seated, four-wheeled, and off-road vehicle completely from scratch. These are the same challenges an engineer faces, while introducing a new product in the automobile industry and during the course of the event, the young souls get an opportunity to showcase their engineering skills and talent. The competition not only test merely engineering and design skills of the students but also entrepreneurial skills, marketing skills and their ability to perform as a team.

The students come out of event well groomed and with a heightened sense of



accomplishment. Spread over a course of three days, the BAJA SAE allows teams to showcase their prototype of a rugged single seated, four- wheel off- road vehicle. The vehicles are then evaluated on various parameters including engineering design, cost and technology innovation. The primary objective of the completion is to replicate real world engineering design projects and the

challenges that come with it. The purpose, therefore, is to present some of the top company's and opportunity to handpick students from the huge talent pool of aspiring and budding engineers. Several students leave this BAJA event with an offer letter in their hands – a bright start for a bright future for themselves and for their country.

## Automotive Clusters in India



Automobile hubs and cluster are spread across the length and breadth of India. Some of the prominent players are:-

1. West side – Hindustan Motors, TATA Motors.
2. North side- Ashok Leyland, BMW, Hyundai, Renault, Toyota Kirloskar.
3. South side- Hero Moto Corp, Maruti Suzuki, Mahindra, GM, John Deere.

## Favorable Policy Regime:-

Auto policy 2002 and Auto Mission Plan 2006- 2016 framework for Automotive manufacturing in India works under following points:-

Manufacturing & Imports free from Licensing and Approvals.

1. WTO - World Trade organization compliant policies (No import restrictions and reduced tariff levels).
2. Robust Legal system and stable Foreign exchange regime.
3. Joined UN-ECE WP29 for global standard in technology.

### **SAEINDIA P.C.E COLLEGIATE CLUB**

#### **Installation 2013-14**



**Dignitaries on the Dias & Team members welcoming the guests**







## Students welcoming guests





## **NATIONAL LEVEL” FACULTY LEADERSHIP DEVELOPMENT WORKSHOP”**

**21<sup>st</sup> & 22<sup>nd</sup> June 2013**

On the first day of the workshop Vice – President, operations, of Mahindra & Mahindra Ltd. Mr. K. G. Shenoy introduced the National Level Workshop by saying that at “National Level there is a need of up gradation in the ways and methods of teaching of the faculty members so that they can motivate students”. He also said that faculties of any field whether they may be innovative or technical must continue to work on betterment of our students and young technocrats so that they can compete with abroad culture of innovations.

He was addressing in Priyadarshini College of Engineering on behalf of Society of Automotive Engineers (SAE) which organized “National Level Faculty Leadership Development workshop. In this event Dr. K. C. Vora, Assistant Director, Automotive Research Association of India; Mr. Sanjay Nibandhe, DGM, and Head, R&D, Mahindra & Mahindra Research Valley, Chennai; Prof. Sudhir K. Gupte, Vice Chair Person, SAE, Development Board Managing Committee Member; Mr. AnshumanVaghdes, Manager, R&D, Mahindra & Mahindra; Mr. Rajeev Mokashi, Automotive Design Consultant; Principal M. P. Singh; Vice – Principal Ravi Kshirsagar; K.S. Zakiudin, H.O.D., Professor Prashant Kadu, convenor were present at the event. The event was moderated by Manish Singh. More than 125 faculty members participated in this workshop from all over India.



Dr. K.C. Vora, Asst. Director, Automotive Research Association of India under Ministry of Heavy Industries, Govt. of India said that every individual is full of potential. By developing the potential it can be utilized for the benefit of society. He also highlighted to the faculty members that they should empower students by giving proper guidance up to their limits.

Mr. Sanjay Nibandhe claimed that opportunities are increasing of increase in opportunities is seen in various competition. BAHA competition is continuing, its journey since 6 years. It creates a platform of future innovation and creativity for the students. Mr. Sanjay requested faculties to encourage students to take "Automotive design" as a career as the automotive sector is a booming sector.

Prof. Sudhir Gupte has thrown light on better relation and understanding between students and faculty. This will help in the boosting up of the students performance. Automotive Design Consultant Mr. Rajeev Mokashi cleared all the doubts regarding the relation between balance and rule followed vehicle design & development.

On the 2<sup>nd</sup> day of workshop, Mr. Anshuman Vaghesh, Manager, R&D, Mahindra & Mahindra discussed the rule book. Prof. Prashant Kadu further extended his participation regarding the workshop by saying that we are proud to organize an innovative event in Nagpur which is the first of its kind. This will help in imbibing professional values in automotive design in students thereby raise the quality of BAHA team. Dr. Vora motivated and cleared various aspects of 'How to Develop the Leadership Quality'. End of this workshop was concluded by taking an oath of bringing professionalism in the work culture whether it is from student or faculty side. This results in discipline. During this event all the queries and doubts of faculty members were cleared in an interactive session.

Prof. Prashant Kadu of Mechanical department of Priyadarshini College of Engineering and his team worked hard for the success.

Under the guidance of Prof. Prashant Kadu his team members, Prof. Nilesh Pathre, Manish Singh, Mohit kumar, Shahrukh Shaikh, Amrendra Singh, Aakash Deep, Ranajoy Datta, Alok Raj, Aniruddh Bhure, Somesh Chauhan, Nilesh , Hemant, Anish Kumar, Shardul Ghusey, Arpit, Sajid, Rana Mondal, Jefferey and other are working for such events.





**Prof.P.S.Kadu lightening the traditional lamp**



**Inauguration of FA program by Dr. K.C .VORA**



**S.NIBANDHE (convener- BAJA-2014) Addressing**



**Dr. M.P. Singh, Principal during inauguration**





**Prof. P.S.Kadu welcoming speech**



**Dr. K.C.Vora briefing about the event**



**Dr. M.P. Singh during FA meet**



**Mr. Sudheer Gupte motivating Faculty Advisors**

**Mr.K.G.Shenoy, VicePresident, Operations, Mahindra& Mahindra, Inaugural address**



**Dr.Sudhir Gupte,Vice Chairman, Development board committee( SAE),addressing the faculty**





# **COVERAGE OF THE WORKSHOP**



**PREPARATIONS FOR VIRTUAL PRESENTATION:-**

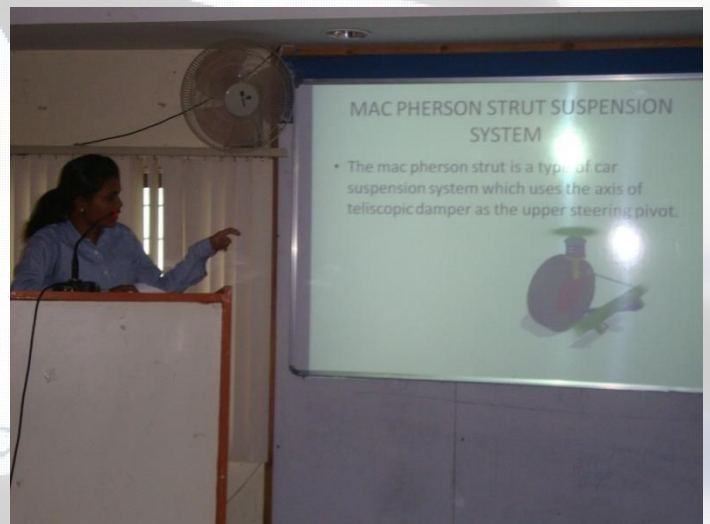




**Anirudha Bhure giving presentation and Ranajoy Datta dicourse about tubular section Frame & rollcage**



**Apurva Meshram presenting suspension**



**Pallavi Thul explaining the suspension**



### Abhishek Kumar explaining wheel assembly



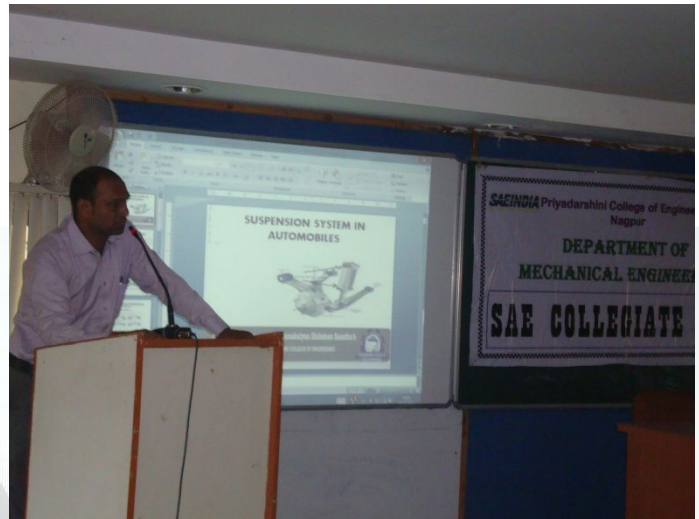
### JeferyShajan presenting the importance of marketing



**Prof. Pramod Wadaskar Judging the team**





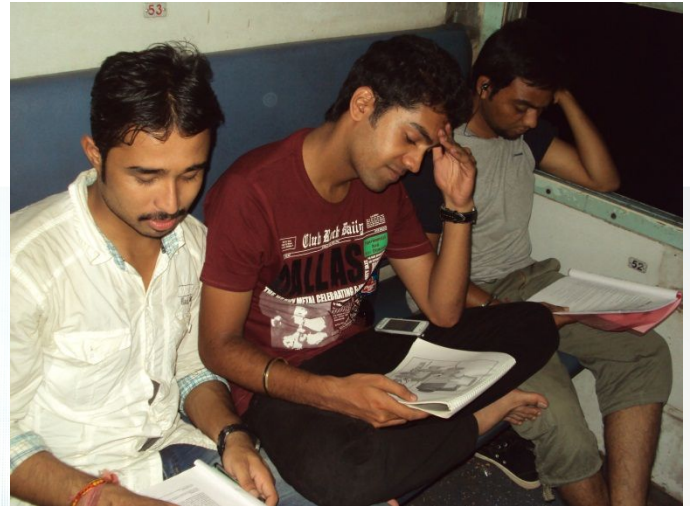


**Technical Presentations**



**Prof. Prashant S.Kadu the faculty advisor for PCE-VIPERS motivating the team**

**JOURNEY TO BANGALORE FOR VIRTUAL (PRELIMINARY) ROUND**



## **NATIONAL LEVEL “VIRTUAL BAJA PRESENTATION 2013”**

27<sup>th</sup> July, 2013

## **BAJA REDEFINED BY P.C.E VIPERS**

Automobile engineering has come of age in India. Automobile hubs and clusters are spread across the length and breadth of India. With this advent SAE INDIA –Society of Automotive Engineers, India and & Mahindra & Mahindra, organized” VIRTUAL BAJA PRESENTATION “competition on 27<sup>th</sup> July 2013 in ShriVenkateshwara College of Engineering, Bangalore.

For VIRTUAL BAJA SAEINDIA 2013 event on 27<sup>th</sup> July in Bangalore, an undergraduate engineer of PCE has participated with team named as “PCE VIPERS”. The team has maintained all the rigorous norms and regulation throughout one year of SAEINDIA collegiate membership before the final official gateway for BAJA SAE INDIA 2014 for becoming eligible to compete with other colleges from all over India.

BAJA SAE INDIA competitions are classified as having created a successful design of “ALL TERRAIN vehicle “(mainly off road vehicle). It is the first time that Priyadarshini College of Engineering from Nagpur has successfully cracked Virtual BAJA competition. In this competition in addition of skills, also requires the knowledge of research and development, artistic creativity in design coupled with leadership and business acumen. PCE VIPERS are continuously striding and working hard to provide a comparison of their current design with the previous year's



design of virtual BAJA competition even if the current design is entirely new. With the boom in the Industrial sector, the education sector has witnessed the mushrooming of engineering college in the last two decades. To fill up this void and to safeguard the interests of automotive engineers such type of events are promoted.

Prof. PRASHANT KADU of Mechanical Engg. Department of Priyadarshini College of Engg. and his team are the prime face of this development in the success of BAJA qualifying event for getting an entry in BAJA SAE INDIA 2014 in INDORE (Madhya Pradesh). His team "PCE VIPERS" consisted of members for BAJA 2014: -

1. V. Mohit Kumar.
2. Aniruddha Bhure.
3. Ranajoy Datta.
4. Abhishek Kumar.
5. Ashwini Raut.
6. Sharukh Sheikh.
7. Somesh Chauhan.
8. Apirva Mesham.
9. Pallavi Thul.

## THE HIGHLY SPIRITED TEAM AT VENUE OF PRESENTATION



THE TEAM AFTER VIRTUAL ROUND RETURNING BACK TO CITY WITH HIGH MOTIVATION AND HAPPINESS OF CLEARING THE VIRTUALS IN FIRST ATTEMPT & GOT THE HONOUR OF BEING THE FIRST TEAM TO CLEAR VIRTUAL FROM NAGPUR.





# **PCE Students got selected in National Level Automotive Competition**

Automobile Engineering has come of age in India. Automobile hubs and clusters are spread across the length and breadth of India. With this advent SAE INDIA–Society of Automotive Engineers India and Mahindra & Mahindra, organized VIRTUAL BAJA PRESENTATION “competition on 27<sup>th</sup> July 2013 in Shri Venkateshwara College of Engineering, Bangalore. And result of the same is declared on 10<sup>th</sup> August 2013 and team from Priyadarshini College of Engineering is one of the winners.

For VIRTUAL BAJA SAEINDIA 2013 event on 27<sup>th</sup> July in Bangalore ,undergraduate engineers of PCE has participated with team named as “ PCE VIPERS” and we are the first college in Nagpur, who got selected in the first attempt. The team has maintained all the rigorous norms and regulation throughout one year of SAEINDIA collegiate membership before the final official gateway for BAJA SAE INDIA 2014 for becoming eligible to compete with other colleges from all over India. BAJA SAE INDIA competitions are classified as having created a successful design of “ALL TERRAIN VEHICLE “(mainly off road vehicle). Priyadarshini College of Engineering from Nagpur has successfully cracked Virtual BAJA competition. In this competition in addition of skills, also requires the knowledge of research and development, artistic creativity in design coupled with leadership and business acumen. PCE VIPERS are continuously striding and working hard to provide a comparison of their current design with the previous year’s design of virtual BAJA competition even if the current design is entirely new.

With the boom in the Industrial sector ,the education sector has witnessed the mushrooming of engineering college in the last two decades .To fill up this void and to safeguard the interests of automotive engineers such type of events are promoted The need of auto design in India is to enhance the significance of design in various automobile aspects such as manufacturing, engineering, management, and marketing. It is necessary for the designers, apex industry organizers and academic institutions to bring out awareness on the role of design.

CONFEDERATION OF INDIA (CII) has been espousing the cause of Design in India for the last 8 years or so. Realizing the fact that designs can play a pivotal role in enhancing the competitiveness of both manufacturing and service industries, Government of India announced a National Design Policy in February, 2007 with the

vision to have a “Design Enabled Indian Industry”. Keeping the spirits of the National Design Policy, the Government has taken the most significant step, and had established INDIAN DESIGN COUNCIL (IDC) in March 2009 chaired by Anand Mahindra. As the ongoing pursuit to establish design as a tool for national competitiveness, CII is bringing out the first India Design Report- a nationwide study on Indian Design Sector.

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8. Apurva Mesham.
9. Pallavi Thu

**Prof. P.S.Kadu giving the introductory speech**



**Principal Dr. M.P. Singh Congratulating the Members of PCE VIPERS for their achievement in Virtual BAJA**







Congrats to the virtual squad

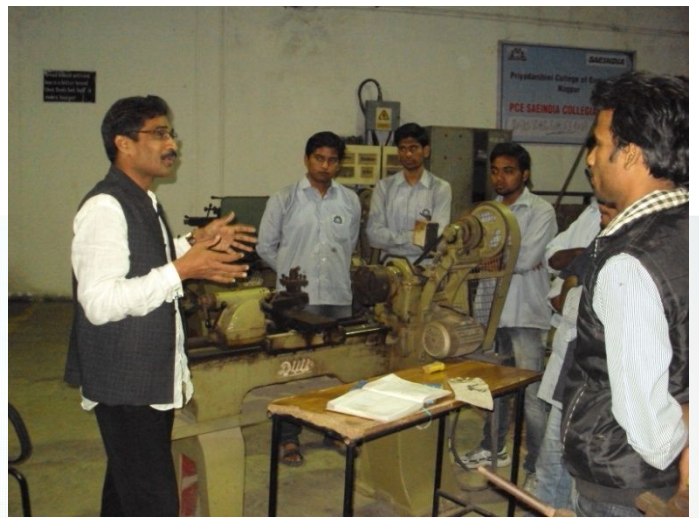
**AT PCE: WORK OF ROLLCAGE:-**





**Experts Guiding The Team About The Technical Aspects Of Rollcage Preparation**





**Prof. P.S.KADU guiding the students during the course of work**



**PRINCIPAL VISITING THE WORKSHOP FOR CHECKING WORK PROGRESS**





### **PRINCIPAL & HOD MECHANICAL ASSESSING THE WORK PROGRESS**



### **PRINCIPAL DISCUSSING DESIGN SPECIFICATIONS WITH TEAM**





**AT PCE – MID NIGHT**





**AT PCE – MID NIGHT**





# TECHNICAL INSPECTION





**Prof. P.S.Kadu & H.O.D Dr K.S. Zakiuddin welcoming Mr. Amit Tekvani  
(Technical Inspector SAEINDIA)**