



**Karpaga Vinayaga College of Engineering
& Technology**

DEPARTMENT OF AUTOMOBILE ENGINEERING



**2nd NATIONAL LEVEL MINI BIKE DESIGN, FABRICATION &
RACING CONTEST**

Autofest'17

RULE BOOK

EVENT DATE: 02nd & 03rd MARCH 2017

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AUTOFEST-2K17

SECTION 1

1.1 Introduction

1.1.1 About us

The formation of the Trust was initiated by the philanthropic spurts exerted by Thiru S. Regupathy, former Minister for State for Home in association with a group of like – minded patrons who are best regarded for their bountiful services to the promotion of education.

The avowed objective of the Trust was to provide facilities for innovative higher education with vocational bias. The College unflinchingly marches towards its ultimate dream of becoming a deemed university. Having established an Arts and Science college of excellence, the trust deemed it fit to start an Engineering college and the Karpaga Vinayaga College of Engineering and Technology (KVCET) took birth.

1.1.2 Mission

Providing Innovation Higher education with greater Accentuation upon high value systems so that personnel for a strong nation building can be shaped.

SECTION 2

2.1 Overview of Event

AUTOFEST '17 is a **2nd National Level Mini-Bike Design and Fabrication Contest** organized by the Department of Automobile Engineering of Karpaga Vinayaga College of Engineering and Technology.

2.1.1 Team Eligibility and Requirements:

Driver:

Every team should nominate two drivers. The Driver must be at least **18** years old and should hold a valid driving license. The drivers should possess relevant documents at the time of the event so that it can be subjected to verification any time during event.

Faculty Advisor:

Each team should have **one faculty Advisor**

Team Member:

There can be a **minimum of 3 and a maximum of 6 members** in each team. The members of the team must be from the same college/university.

Team Name:

Each team should register, with the organizer, an inspirational and meaningful team name.

Team Logo:

Every team should have their own original team logo. Do not use copied or modified logos.

Team Captain:

Each team has to nominate a team captain and vice team captain.

Discipline:

Each team member must be diploma/undergraduate/postgraduate student of any discipline studying in any educational institution in India.

2.1.2 Registration Requirement and Procedure:

Procedure: Team Registration is open on our website:

Registration steps:

- Register your team online on the event website [www.autofest.in]
- After online registration **deposit the registration fees** in the account (details provided below).
- After online registration and the payment confirmation, a copy of the online registration form (attested by HOD/Dean/Principal of the respective College/University) along with the copy of transaction receipt must be mailed to autofest17@gmail.com. Once the documents are received, we will send you the registration confirmation email.
- All these correspondence should take place from Team e-mail ID or Team captain's e-mail ID only.
- Your mails should contain Name of Team, Name of Captain, Name of College and Team ID otherwise your mail may not be considered.

Registration fee for each team is INR 2,500/- only (Including all taxes) and this registration fee will not be refunded in any case.

Modes of Payment: (DD & NEFT)

Demand Draft in favor of “**The Principal, Karpaga Vinayaga College of Engineering and Technology, Kanchipuram – 603308**”, Payable at Chennai.

NEFT details given in the last page of the rule book.

2.1.3 Safety Requirements:

Driver's Equipment:

- The Driver must use a motocross helmet, riding gloves, shoes and all safety kits during the endurance test.
- The Driver's seat should be properly fixed and rigid.
- **Crash guard, mud guard etc.?**
- Each team must be having two drivers and they both must have a valid driving license which must be presented on the event site when asked by the officers.

2.1.4 Technical Specifications:

The following requirements and restrictions will be in force throughout the technical inspection. Noncompliance of any of these must be corrected and the bike should be re-inspected before it is allowed to operate under power.

1. Once the bike has been presented for judging in the design events, or submitted for Technical Inspection, and until the bike is approved to compete in the dynamic events, any sort of modifications are strictly prohibited.
2. **Wheel base:** The bike must have a wheelbase of maximum 1200 mm.
3. **Visible access:** All items mentioned in the inspection checklist must be clearly visible to the technical inspectors without using instruments such as endoscopes or mirrors. Visible access can be provided by removing body panels or by providing removable access panels.
4. **Overall Length:** The bike must have an overall length of Maximum 1600mm.
5. **Width:** The bike must have an overall width of maximum 600 mm.
6. **Height:** The bike must have an overall height of maximum 900 mm.
7. **Ground Clearance:** The bike must have a minimum ground clearance of 220 mm.
8. The bike must maintain all required specifications, e.g. ride height, suspension travel and braking capacity, throughout the competition.
9. **Bike Identification:**

All the teams will be given a unique identification number, and the bike will be referred to by this number during the whole event. Teams are required to have a team name with a team logo along with the college logo which is to be placed on the Bike's body. Teams are advised not to place any logos on the front of the Bike. The Bike number will be placed on the front of the Bike along with the event logo.

10. Manufacturing Cost:

Teams are allowed to use Maximum Rs 25,000/- to manufacture their bike. Any team crossing this limit will invite a penalty in cost report points. Teams are allowed to use used parts in their bikes at their own risk.

Only **technical cost** of the bike will be taken into consideration and during endurance test, teams are required to bring the original bills.

11. **Weight:** The weight of the bike should not exceed 80 kg.
12. **Suspension:** Vehicle must be equipped with proper suspension system.

13. Engine Specification:80 cc

ENGINE	
Layout	Single Cylinder, Air-cooled ,Two-Stroke.
Displacement	Under 80.00 cc
Fuel System	Carburetor/Fuel Injection
GEAR BOX AND DRIVE	
Type	Automatic, Manual
Transmission Type	Belt/Chain
CHASSIS AND SUSPENSION	
Frame	Any
Front Suspension	Telescopic Forks
Rear Suspension	Hydraulic shocks/Swing arm
WHEELS AND TYRES	
Wheel Type	Alloy or Spokes
Wheel Size (Front/Rear)	< 16 inches
Tyre	With Tube or Tubeless
BRAKES	
Front	Drum/Disc
Rear	Drum/Disc

***Engine Kill Switch Mandatory**

E-Bike/Solar Bike:

Battery type	24-volt (2*12) or 36-volt(3*12) or 48-volt(4*12)
Max Operating Voltage	(15,20 & 24 AH) 26.4-volt(24volt System),39.6-volt(36V system), 52.8V(48V system)
Motor	Less than 800W
Motor Type	Brushless DC Motor (or) DC Motor with Brush (or) HUB Motor
Transmission	Any type
Frame	Any
Front Suspension	Any
Rear Suspension	Any
Wheel Type	Alloy (or) Spokes
Wheel Size(Front & Rear)	Less than 16inch Diameter
Tyre	Tube(or) Tubeless
Front Brake	Drum/Disc
Rear Brake	Drum/Disc
starter	Electric
Top Speed	40km/hr

***Engine Kill Switch Mandatory**

SECTION 3

CHALLENGE:

The teams will be competing in two rounds, one is the static round and the other one is the endurance test round. Points are distinctively divided for the two rounds.

3.1 Static Round:

JUDGMENT CATEGORIES AND POINT DISTRIBUTION:

3.1.1 Document Requirement:

During static round soft copies as well as hard copies of all reports are to be submitted.

1) **Overall design report:** This report should consist data of following departments and their calculations.

3.2.1 Technical Inspection (T.I):

Objective: The objective of technical inspection is to determine if the Bike meets the requirements and restrictions of event rules. T.I is a non-scoring activity. The bikes will be permitted to take part in the competition only if they pass in the technical inspection.

- Each bike must pass all parts of technical inspection and testing before it is permitted to participate in any dynamic event. The exact procedures and instruments employed for inspection and testing are entirely at the discretion of the Chief Technical Inspector.
- Visible access can be provided by removing body panels or by providing removable access panels to check the various components.
- Bike must be presented for technical inspection in finished condition, i.e. fully assembled, complete and ready-to-run. Technical inspectors will not inspect any Bike presented for inspection in a partially complete state.
- **Corrections:** If a bike does not comply with the rules, then necessary correction must be done to get re-inspected.

Questionnaire:

There will be a questionnaire round to any of the team members by the judges. Questions will be related to manufacturing and other technical aspects of the bike. Engineering practices of the teams is also evaluated in this round.

2) COST REPORT:

In this report, the cost of the components used in the bike must be specified. It is cross checked to ensure every component and system mentioned in the cost report is used in the bike. The actual cost must not vary from that in the report.

Manufacturing Level:

Good engineering practice will reflect a great manufacturing level. The bike will be examined by the judges at the time of Dynamic Event, so the Participating teams are advised to manufacture the Bike with pre-planned strategies so that the Bike would be able to compete in several tasks and tests.

Point Distribution for Static Round:

S.NO	CATEGORY	POINTS
1	Design Evaluation	300
2	Cost Report	200
3	Innovation	250
4	Marketing Presentation	250
	Total	1000

3) TECHNICAL SPECIFICATION SHEET:

S.NO	TECHNICAL CATEGORY	SPECIFICATION (DIMENSIONS A IN 'MM')
1	Overall Length	
2	Overall width	
3	Overall Height	
4	Overall Weight	
5	Wheelbase	
6	Ground Clearance	
7	Engine	
8	Frame Material	
9	Brakes Used	
10	Suspension	1.Front
		2.Rear
11	Fuel Tank Capacity	
12	Tyres	

3.2 DYNAMIC ROUND:

Point distribution for dynamic round:

S. no	Category	Points
1	Acceleration	100
2	Braking	100
3	Figure of '8'	100
4	Endurance	700
5	Total	1000

3.2.1 Dynamic Tests:

1. **Break Test** – All the bikes have to pass the brake test to participate in any of the dynamic events. The bike must stop in a straight line after the brake is applied. Each Bike will be given 4 attempts to pass the brake test.

Note: Brake Test does not have any points, but it is mandatory for the teams to qualify this round participate in the endurance round.

2. Acceleration Test:

Objective: The acceleration test evaluates the bike's acceleration in a straight line on a flat pavement.

Procedure: The bike will accelerate from a standing start over a distance of 100 m on a flat surface. The foremost part of the bike will be staged at exactly behind the starting line. The time taken to accelerate would be measured.

Scoring: The acceleration score is based upon the corrected elapsed time. Elapsed time will be measured from the time the bike crosses the starting line until it crosses the finish line. Scoring Formula: $50 * ((T \text{ longest} - T \text{ Yours}) / (T \text{ longest} - T \text{ shortest}))$

Penalty: Cones Down or Out: A two (2) second penalty will be added for each DOO (Including entry and exit gate cones) that occurred on that particular run to give the corrected elapsed time.

Did not Attempt (DNA): If the bike did not attempt or if it does not complete the event, then those teams would receive DNA.

3. SKID PAD TEST:

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

1. **Skid Pad Layout** – There will be two (2) pairs of concentric circles in a figure of eight pattern. The centers of these circles will be 17.5 m apart. The inner circles will be 14.5 m in diameter, and the outer circles will be 20.5 m in diameter. The driving path will be the 2.5 m (8.2 feet) path between the inner and outer circles. The Bikes will enter and exit through gates on a 3 m wide path that is tangential to the circles where they meet. The line between the centers of the circles defines the start/stop line. A lap is defined as traveling around one of the circles from the start/stop line and returning to the start/stop line.

PROCEDURE:

- The track is laid on as shown and the Bike will enter the track perpendicular to the figure eight. They must take one full lap on the right circle to establish the turn and the bike must move on to the left circle to complete the lap. This completes one lap and will be timed. Immediately upon finishing the circle lap will be completed, and the bike will exit the track. The bike will exit at the intersection moving in the same direction as entered.
- A Driver has the option to take a second run immediately after the first.

Scoring Formula:

$$\text{Skid Pad Score} = 50 * ((T \text{ longest} - T \text{ yours}) / (T \text{ longest} - T \text{ shortest}))$$

PENALTIES:

- Cones Down or Out – A penalty of 1 second will be added to the time for every cone that is knocked down or out (including gate cones).
- Unfinished – Bike's that has gone out of the track will continue as long as they have not gone off course will be classified as unfinished.
- Incorrect Laps – Bike's that do not follow procedure, i.e. run an incorrect number of laps or run the Laps in the wrong sequence will also be classified as unfinished.

4. AUTOCROSS EVENT:

Objective:

The objective of the auto cross event is to evaluate the Bike's handling qualities without the hindrance of competing bikes. The autocross course will combine the performance features of acceleration, braking, and cornering into single event. The maneuverability of the bike is also checked in this event.

Penalties:

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

- **Cone Down or Out (DOO):** Five (5) seconds per cone, including any after the finish line.
- **Off Course:** Driver must re-enter the track at or prior to the missed gate or a twenty (30) second penalty will be assessed.
- **Missed Slalom:** Missing one or more gates of a given slalom will be counted as one "off-course" per occurrence. Each occurrence will incur a twenty (30) second penalty.
- **Stalled & Disabled Bikes:** If a bike stalls and cannot restart without external assistance, the bike will be deemed disabled. Bike deemed disabled will be cleared from the track by the track workers. At the direction of the track officials team members may be instructed to retrieve the Bike. Bike recovery may only be done under the control of the track officials.

5. Endurance Event:

Objective: The endurance event is designed to evaluate the Bike's overall performance, reliability and efficiency.

Procedure & Specifications:

In general, the team completing the laps in the shortest time will earn the maximum points available for this event. The endurance distance is approximately 3 km.

1. Course speeds can be estimated by the following course specifications. Average speed should be around 25 km/hr. with top speed of approximately 60 km/hr. (50 Mph).
2. **Endurance Penalties:** The penalties in effect during the endurance event are listed below:
 - **Cone Down or Out:** Five (5) seconds per cone. This includes cones before the start line and after the finish line.
 - **Off Course (OC):** For an off Course, the driver must re-enter the track at or prior to the missed gate or a twenty (20) second penalty will be assessed.
 - **Missed Slalom:** Missing one or more gates of a given slalom will incur a twenty (20) second penalty.
 - **Running Out of Order:** 2 Minutes

SECTION: 4

EVENT RULES AND ORGANIZER AUTHORITY:

4.1 Official Announcement:

All the official announcements and the information regarding the competition will be displayed on the official websites of **Department of Automobile Engineering**

Our official sites are and you can also join us through Face book for quick updates:
www.facebook.com/Autofest-1867843843460123

Official Page:

After completion of registration, important information will be sent through the emails to the respective team captains/Faculty Advisor. The rules will be same throughout the event and any amendments done will immediately be informed the entire participating team through mail/face book page.

4.2 Rules Authority:

All the authority of rules is under "AUTOFEST17" Organizing Committee. Official announcements from "AUTOFEST17" Organizing Committee shall be considered part of and have the same validity as these rules. Query regarding event questions concerning the meaning or intent of these rules will be resolved by the Technical committee of AUTOFEST'17'.

4.3 Validity of Rules:

The rules and other information related to events is valid to till completion of the event and schedule as per decided by the AUTOFEST'17. Rule of other may be different.

4.4 Rules Compliance:

By entering through registration a AUTOFEST'17 2nd National level competition, the team members, faculty advisors and other personnel of the entering university agree to comply with, and be bound by, the rules and all rules interpretations or procedure issued or announced by AUTOFEST'17 Organizing Committee. All team members, faculty advisors and other university/college representatives are required to cooperate with, and follow all instructions from competition organizers, officials and judges.

4.6 Behavior:

All the member of each and every team will be requiring following the rules laid by AUTOFEST17, during the competition. Any member's failure to follow the rules will result in 20% point reduction or elimination from the event. Arguments with officials may also result in the team being eliminated from event.

4.7 Smoking and Illegal Material:

Alcohol, illegal drugs, weapons or other illegal material are strictly not allowed on the event site during the competition. This rule will be in effect during the entire competition. Any violation of this rule by a team member will cause the expulsion of the entire team. This applies to both team members and faculty advisors. Any use of drugs, or the use of alcohol by an underage individual, will be reported to the authorities for prosecution.

4.8 Unsportsmanlike Conduct:

In the event of unsportsmanlike conduct, the team will receive a warning from an official. A second violation will result in expulsion of the team from the competition.

4.9 Official Instructions:

Failure of a team member to follow an instruction or command directed specifically to that team or team member will result in a twenty-five (25) point penalty. There should not be directly involvement of faculties of Industrial in Designing and Manufacturing of the bike.

4.10 Arguments with Officials:

Argument with, or disobedience to, any official may result in the team being eliminated from the competition. All members of the team may be immediately escorted from the grounds.

4.12 Trash Clean-up:

Cleanup of trash and debris is the responsibility of the teams. The team's work area should be kept uncluttered. At the end of the day, each team must clean all debris from their area and help with maintaining a clean paddock.

4.13 Competition Objective – A Reminder

The AUTOFEST event being organized by Department of Automobile Engineering is a challenge of design engineering and manufacturing competition that requires performance demonstration of mini bikes and is NOT a race. Engineering ethics will apply. It is recognized that lots of hard work has been put in by the teams for an entry into many events. It is also recognized that this event is an "innovation enhancement experience" but that it often times becomes confused with a high stakes race. In the heat of competition, emotions peak and disputes arise. The officials of AUTOFEST are trained volunteers and maximum effort will be put in to settle the disputes an equitable, professional manner.

SECTION 5

AWARDS AND PRIZE MONEY

Award Categories	
80 CC	1st prize – 20,000
	2nd prize – 15,000
	2 Consolation prize - 5,000
E-bike/Solar bike	1st prize – 10,000
	2nd prize – 5,000
OTHERS	Best Rider
	Best Team
	Best Innovation
	Best Remodeled Bike
	Auto – Clickers (Best Photo)

AUTOFEST

SECTION 6

CONTACT DETAILS:

<p>Contact us @ autofest17@gmail.com Like us @ http://www.facebook.com/autofest2017 Website: www.autofest.in</p>	<p>Student Coordinators</p> <ol style="list-style-type: none">1. R. Gokula Kannan- 96775833582. R. Prasath - 97909455243. P. Karthikeeyan - 86080521964. D.ManoSankar– 96597932455. S.Sasi Kumar - 9626304465
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<p>Mail this completed form with payment to: The Co-ordinate AUTOFEST'17 Department of Automobile Engineering Karpaga Vinayaga College of Engineering & Technology GST Road, Chinnakolambakkam, Padalam - 603308, Maduranthagam Taluk, Kanchipuram District, Tamilnadu. E-mail : autofest17@gmail.com Website: www.autofest.in Mobile : 8012886677,7811940455</p>	<p>Events Payment: All the payments should be made by a DD drawn in favor of The Principal, Karpaga Vinayaga College of Engineering and Technology payable at Chennai. Electronic fund transfer mode – RTGS/NEFT Bank : Canara Bank IFSC CODE :CNRB0001888 MICR CODE: 600015137 Branch :Vaiyavoor Account No. 1888101011988 Account Name: The Principal</p>
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