The University of Toledo Formula SAE Team

Design · Build · Test · Compete

2015-2016 Sponsorship Packet

Applying classroom concepts to real-world problems…

Our mission is to gain a broader perspective of the engineering profession and to share acquired knowledge with peers and younger teammates.

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TOLEDO FORMULA SAE

ABOUT THE TEAM

The 2015-2016 season will mark the 22nd year of the University of Toledo Formula SAE team. The 2014-2015 car placed 17th out of 120 teams in Michigan, 6th out of 28 teams in Canada, and 38th out of 85 teams due to an electrical malfunction in Lincoln Nebraska during the regular season. In the post season the team attended The University of Toronto Shootout placing 2nd & 4th out of 72 drivers and 2nd place overall. The team retired the car at the Lawrence Tech Grand Prix where we drove home with a 1st Place Victory for the second year in a row.

This years team includes a wide variety of students, from freshmen to seniors and with majors ranging from engineering to business. The team is broken down into five specialized areas, including chassis, suspension, power train, electrical, and aerodynamics, with each group having a leader.

Each group leader and team leader is a mentor to younger students. The leaders not only teach them about racecar designs, manufacturing, and fabrication but also help to mentor the younger students in their courses of study. The SAE program offers students the opportunity to apply knowledge learned in the classroom to real-world problems, with the car expressing each individual's research, knowledge, and creativity.

IN THE NEWS

The Toledo Motorsports team can be seen in numerous publications year round. This years media coverage included multiple newspaper and television stories.

As a sponsor your name will be seen anywhere the car goes!

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ROCKET MOTORSPORTS

IN THE COMMUNITY

We enjoy being actively involved in the community and are honored to represent the University of Toledo and our sponsors on not only a world stage but a local one as well. We actively participate in events outside of competition, proudly displaying your name everywhere we go.

Community events include:
- University of Toledo Football Tailgates
- University of Toledo Homecoming Parade
- Close Park Halloween Parade
- Visiting with local Cub Scout packs
- Local Autocrosses
- University of Missouri S&T Autocross
- Mentors for College of Engineering "Be an Engineer for a Day"
- Mentors for local high school building competition
- Cedar Point High School Physics Day
- Newspaper publications and Television stories

2015-2016 SPONSORED DESIGN FEATURES

- ◊ TARGET WEIGHT OF 400 LBS
- ◊ HYBRID CHASSIS CONSTRUCTED OF COMPOSITE AND METAL STRUCTURES FOR REDUCED WEIGHT AND INCREASED STRENGTH
- ◊ SWITCHING FROM A 4-CYLINDER ENGINE TO SINGLE CYLINER ENGINE FOR REDUCED WEIGHT, COMPLEXITY, AND INCREASED FUEL ECONOMY
- ◊ DRIVER ADJUSTABLE ANTI-ROLL BAR FOR INCREASED DYNAMIC TUNING
- ◊ ANTI-DIVE A-ARM GEOMETRY FOR MORE CONSISTANT AERODYNAMIC DOWNFORCE
- ◊ OPTIMIZATION OF OUR FLOATING BRAKE ROTOR DESIGN FOR FURTHER REDUCED ROLLING FRICTION
- ◊ INCREASE IN PARAMETERS MONITORED BY THE DATA ACQUISITION SYSTEM FOR IMPROVED TUNING IN BOTH CHASSIS AND ENGINE AREAS
- ◊ NEW INTAKE MANIFOLD CONSTRUCTED FROM 3D PRINTED MATERIALS
- ◊ IMPROVED FUEL AND OIL TANK DESIGNS FOR WEIGHT, FLOW, AND EFFICENCY
- ◊ IMPROVED SEAT FOR DRIVER COMFORT AND REDUCTION IN CG HEIGHT
- ◊ IMPROVE ELECTRONIC DASH TO INCREASE DRIVER FEEDBACK
- ◊ LASER NOTCHED CHASSIS FOR TIGHTER TOLERANCE & REDUCTION IN DEFLECTION DURING THE WELDING AND NORMALIZING PROCESS

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SPONSORSHIP

SPONSORSHIP LEVELS

In Order to keep this path of excellence Rocket Motorsports is reaching out to the time, talent, and treasure of the business community.

BRONZE LEVEL ($500-$1000)

- ◊ Small logo on car body
- ◊ Name will appear on website
- ◊ 4 x 6 picture of team at competition

SILVER LEVEL ($1000-$5000)

- ◊ Medium-sized logo on car body or front wing
- ◊ Name will appear on website
- ◊ 5 x 7 picture of team at competition

GOLD LEVEL ($5000-$10,000)

- ◊ Large logo on car's side pods or rear wing
- ◊ Name will appear on website
- ◊ 8 x 10 picture of team at competition
- ◊ You are invited to collaborate with a design lead at a weekly informational workshop
- ◊ You are invited to collaborate with the team during a weekend test session

PARTNERSHIP LEVEL (10,000+)

- ◊ Large logo on nose cone / top panel
- ◊ Large logo on team trailer
- ◊ Name will appear on website
- ◊ 8 x 10 picture of team at competition
- ◊ Car may be put on display at your facility
- ◊ You are invited to present at a weekly informational workshop
- ◊ You are invited to collaborate with the team during a test session
- ◊ You are invited to collaborate with the team before they leave for a major competition
- ◊ Access to the current team's resumes for full time and co-op
- ◊ Your company logo on the team's shirts at competition
- ◊ Other benefits can be discussed with the team after sponsorship

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CONTACT INFORMATION

WHERE WE ARE LOCATED

The Toledo Formula SAE team's auto lab is located in North Engineering of the Engineering Complex (NE-1031) on Westwood Avenue.

Checks can be made payable to:
"The University of Toledo Foundation"
with the memo "Formula SAE"

THANKS TO OUR SPONSORS

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APPENDIX

- What is Formula SAE?
- The Events at a Formula SAE Competition
- About the Cars Built
- International Collaboration

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FORMULA SAE SERIES

WHAT IS FORMULA SAE?

Formula SAE is an international collegiate competition in which students design, manufacture, and test an open-wheeled formula-style racecar. Seven competitions are then held every year in six countries with the world championship held at Michigan International Speedway in Brooklyn, Michigan where over 130 universities from 14 countries will compete to be the #1 team in the world.

COMPETITION CATEGORIES

The competition is broken down into two categories: static and dynamic events. The static events include cost, presentation, and design, while the dynamic events include acceleration, skid-pad, autocross, and endurance/fuel economy. At the end of the competition, the scores from each event are tallied and the team with the most points overall is the winner of the competition. The open nature of the rules allows for diverse design solutions. Each event is treated as a real scenario judged by industry experts from each respective field.

STATIC EVENTS

COST (100 POINTS)

In this event, teams submit a detailed report of all the costs and capital expenses used to build their prototype racecar. The event also evaluates the team members' knowledge of manufacturing techniques and processes. Accounting and Financial skills are learned and put to the test by the students for this portion of competition. Each team must show their ability to relate the cost of producing their design in a real world setting.

PRESENTATION (75 POINTS)

Here the teams create and present a business plan to a group of potential investors. This event challenges students to use their economic, business, and advertising knowledge to sell their company and product.

DESIGN (150 POINTS)

Here student's design and manufacturing process are judged by working professionals in the automotive racing and performance industry. Students are examined for their knowledge and implementation of kinematics, dynamics, fluid mechanics, and thermodynamics. Judges then will inquire students ability to integrate these components together in an efficient manufacturing process to form a winning racing car.

DYNAMIC EVENTS

ACCELERATION (75 POINTS)

This event evaluates the car's acceleration in a straight line for 75 meters on flat pavement.

SKID-PAD (50 POINTS)

Here the car is measured on its ability to corner on flat pavement while driving on a constant-radius turn. After completion of the event, the times are put into an equation to determine the lateral G forces the car saw.

AUTOCROSS (150 POINTS)

This event shows the car's ability to handle in hairpin turns, slaloms, and straights without the hindrance of competing cars. If a cone is knocked down, time is added to the total time to complete this one-lap course.

ENDURANCE/FUEL ECONOMY (400 POINTS)

This course consisting of 20 laps each 1.1 km long tests not only the car's reliability and overall performance but also the driver's skill and composure. No work can be done on the car while it is in the event. At the 10th lap, the driver must come in to switch drivers. The car must then restart and finish to score any points. The amount of fuel used is measured and compared to other teams' use at the end of the endurance event.

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TOLEDO FORMULA SAE

ABOUT THE CARS

Starting directly after the competition at MIS, students begin an analysis of the years performance from collected data, FMEA diagrams, judges opinions, and other sources. This analysis leads to optimization and refinement of the previous design as well as implementation and integration of new designs for the upcoming season. A project management schedule and proposed budget are then created for research, development, manufacturing, and testing. Manufacturing for this season will begin with the start of the fall semester on December 1st, with the first run of the car scheduled for March 1st. Extensive testing of the new car will follow up to the competition in May 2016.

Goals for the 2015-2016 car are tailored around vehicle and systems integration and improving fuel economy of the car. This began with the chassis, driveline, and suspension teams searching for ways to reduce mass and rolling resistance. The aerodynamics team members are also looking into ways to reduce aerodynamic drag and increase downforce, and the powertrain team continues to work on optimization of intake, exhaust, and engine tuning. The design features highlighted below are the results of this analysis.

AROUND THE WORLD

For the past four years we have hosted TuFast from the Technical University of Munich, Germany and also hosted the Brazilian team "FEI" for two years, who placed 1st in the Brazilian competition for the past 6 years, for several weeks before competition. Sharing our lab and test facilities with world champion teams is an experience that each of our members look forward to. The knowledge gained, comradery, and experiences are unforgettable, and both teams are looking forward to their return this May.

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