

2016 FORMULA SAE LINCOLN / ELECTRIC

Event Guide



FORMULA SAE LINCOLN / ELECTRIC

2016 SAE PRESIDENT'S MESSAGE



Dear Formula SAE® Participants and Organizers:

Welcome to the Formula SAE competition at Lincoln Airpark in Lincoln, Nebraska.

Formula SAE is steeped in tradition and competition. Now in its 35th year, Formula SAE provides the real-world challenges of systems engineering, design and problem solving, along with the teaming challenges of collaboration and cooperation. In short, Formula SAE, along with all of the SAE Collegiate Design Series™ competitions, provides the skills and experiences needed for a well-rounded engineering education.

Through the years, Formula SAE has evolved to reflect the technological advancements in automotive engineering. Along with the traditional internal combustion engines, competitions incorporate hybrid and electric technologies. In addition to the competitions held here in the United States, SAE International recognizes seven international Formula SAE/Formula student competitions organized by international parties.

The types of learning opportunities are just as diversified. This week, collegiate engineering students from several nations will compete in a series of static and dynamic events designed to challenge their engineering, problem-solving and teamwork skills. The students will work hard and compete to win. Some will earn top honors, others will not. But all will leave here winners because they will be better engineering students.

You, along with the nearly 1,800 competitors from 107 schools are joining the next generation of engineers who will work to develop the technologies needed for higher-performing and more innovative performance vehicles.

The Formula SAE® competition – along with the entire Collegiate Design Series™ – is a crucial part of the fabric of SAE International. With more than 127,000 members in over nations around the world, SAE International continually works to advance engineering education to all levels of students and professionals.

Good luck to everyone competing in this event. The experiences you gain this week will last throughout your lives. Also, I want to thank everyone for their hard work, support and participation; it's because of you that this competition is such a success.

Sincerely,,

A handwritten signature in black ink, appearing to read 'C. Oge'. The signature is fluid and stylized, with a large loop at the end.

Cuneyt L. Oge
President, SAE International

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CONCEPT OF THE COMPETITION

The Formula SAE® Series competitions challenge teams of university undergraduate and graduate students to conceive, design, fabricate and compete with small, formula style, competition vehicles. To give teams the maximum design flexibility and the freedom to express their creativity and imaginations there are very few restrictions on the overall vehicle design. Teams typically spend eight to twelve months designing, building, testing and preparing their vehicles before a competition. The competitions themselves give teams the chance to demonstrate and prove both their creation and their engineering skills in comparison to teams from other universities around the world. Registered for this event are 80 Internal Combustion Teams and 28 Electric Teams from colleges and universities. The end result is a great experience for young engineers in a meaningful engineering project as well as the opportunity of working in a dedicated team effort.

For the purpose of this competition, the students are to assume that a manufacturing firm has engaged them to produce a prototype car for evaluation as a production item. The intended sales market is the nonprofessional weekend competitor. Therefore, the car must have very high performance in terms of its acceleration, braking, and handling qualities. The car must be low in cost, easy to maintain, and reliable. In addition, the car's marketability is enhanced by other factors such as aesthetics, comfort and use of common parts. The manufacturing firm is planning to produce four (4) cars per day for a limited production run. The challenge to the design team is to design and fabricate a prototype car that best meets these goals and intents. Each design will be compared and judged with other competing designs to determine the best overall car.

Over the course of three days, the cars are judged in a series of static and dynamic events including: technical inspection, cost, presentation, and engineering design, solo performance trials, and high performance track endurance. These events are scored to determine how well the car performs. In each event, the manufacturing firm has specified minimum acceptable performance levels that are reflected in the scoring equations.

STATIC EVENTS:

Design: The students explain their constructive solutions to a jury of experts from the automotive and motorsport industries in report and discussion. The concept of the design is to evaluate the engineering effort that went into the design of the car and how the engineering meets the intent of the market. The car that illustrates the best use of engineering to meet the design goals and the best understanding of the design by the team members will win the design event.

Cost: The students are to assume that a serial production of 1000 cars a year will follow the prototype. The cost calculation is discussed with a jury based on a report. The objective of the event is for the participants to learn and understand the manufacturing techniques and processes of some of the components that they have chosen to purchase rather than fabricate themselves.

Presentation: The objective is to evaluate the team's ability to develop and deliver a comprehensive business case that will convince the executives of a fake manufacturing firm that the team's design best meets the demands of the amateur weekend competition market and that it can be profitably manufactured and marketed.

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#FSAELINCOLN

DYNAMIC EVENTS:

Acceleration: The cars are evaluated on their accelerating abilities from a standing start over a distance of 75 meters.

Autocross: The objective is to evaluate the car's maneuverability and handling qualities on a tight course without the hindrance of competing cars. The course will combine the performance features of acceleration, braking and cornering into one event. The results of the Autocross scores determine the starting order for endurance.

Skid-Pad: The objective is to measure the car's cornering ability on a flat surface while making a constant-radius turn. The course will be a pair of concentric circles in shape of the number 8; the cars demonstrate how good lateral forces can be absorbed (up to 1.4g).

Endurance: Over a distance of 22 km the cars have to prove their durability under long-term conditions. Acceleration, speed, handling, dynamics, fuel efficiency, reliability – the cars have to prove it all.

THE FOLLOWING POINTS ARE POSSIBLE:

Static Events	75	Presentation
(Thursday)	150	Design
	100	Cost Analysis
Dynamic Events	75	Acceleration
(Friday & Saturday)	50	Skid-Pad
	150	Autocross
	100	Fuel Efficiency
	300	Endurance
TOTAL POINTS	1000	

GENERAL MOTORS

CREATING NEW WAYS TO MOVE.

At General Motors, we adhere to the same principles that underline the Formula SAE philosophy—dynamic collaboration, constant innovation and unrelenting spirit.

Now, you have the chance to join us, as we redefine mobility. Our new, state-of-the-art Performance and Racing Center is improving vehicles for our racers as well as our customers. And with our pure-electric Chevy Bolt EV, autonomous driving technology and car-sharing initiatives, we're raising the bar in sustainability, connectivity and affordability.

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2016 FORMULA SAE® LINCOLN

SCHEDULE OF EVENTS

WEDNESDAY, JUNE 15

		Location
10:00 a.m.	Tech Inspectors Volunteer Review Session	Danley Bldg
5:30 p.m.	Welcome Ceremony Sponsored by Honda	Main Tent
6:30 p.m.	Captain and Advisors Meeting	Main Tent
7:30 p.m.	Official Closing of the Site	
8:00 p.m.	Everyone must be off site	

THURSDAY, JUNE 16 (all times preceded by “~” are approximate)

		Location
8:00 a.m.	Drivers Meeting - Brake & Practice - Mandatory	Main Tent
7:30 a.m.	Judges Meeting for Design	Danley Bldg
8:00 a.m.	Judges Meeting for Cost	Cost Tent
8:00 a.m.	Judges Meeting for Presentation	Arnold Elementary School
8:00 a.m. - 6:00 p.m.	Design Judging -1st Round Open	Danley Bldg
8:30 a.m. - 5:00 p.m.	Cost Event Open	Main Tent
8:30 a.m. - 5:00 p.m.	Presentation Event Open	Arnold Elementary School
Noon - 1:00 p.m.	Lunch Break	
2:00 p.m.	Dynamic Event Courses Open for Driver Walks	
5:30 p.m.	Drivers Meeting - All Dynamic Events - Mandatory	Main Tent
6:00 p.m.	Design Judges Meeting - Judges only	Offsite
7:30 p.m.	Official Closing of the Site	
8:00 p.m.	Everyone must be off site	
~9:00 p.m.	Design Finalist announced online (www.sae.org and social media)	

FRIDAY, JUNE 17 (all times preceded by “~” are approximate)

		Location
7:30 a.m.	Course Crew Briefing - Acceleration and Skid Pad	Event Courses
8:00 a.m. - 11:30 p.m.	Skid Pad Event and Acceleration Events Open	Track
8:00 a.m. - 4:00 p.m.	Design Feedback for Non-finalists	Danley Bldg
11:45 a.m. - 12:45 p.m.	Lunch Break; Student Pizza Lunch sponsored by Honda	Main Tent
1:00 p.m.	Course Crew Briefing - Autocross	Track
1:30 p.m. - 4:30 p.m.	Autocross Event Open	Track
5:00 p.m. - 7:30 p.m.	Design Finals	Danley Bldg
7:30 p.m.	Official Closing of the Site	
9:00 pm	Everyone must be off site	

SATURDAY, JUNE 18 (all times preceded by “~” are approximate)

		Location
8:00 a.m.	Endurance Course Crew Briefing	Track
~8:30 a.m.	Top 3 Teams Design Finalists Announced	
9:00 a.m. -- 4:00 p.m.	Endurance/Fuel Economy Event Open	Track
9:00 a.m. - 2:00 p.m.	Design Feedback for Finalists not Top 3, by appointment	Danley Bldg
~Noon - 1:00 pm	Lunch Break	Main Tent
~4:30 pm	Presentation Highlights	Main Tent
~5:45 pm	Design Review of Top 3 Teams	Main Tent
~7:00 p.m.	Awards Ceremony Sponsored by General Motors	Main Tent
8:30 p.m.	Official Closing of the Site	
9:00 p.m.	Everyone must be off site	

SUNDAY, JUNE 21

10:00 a.m. - 2:00 p.m.	Site Open ONLY for Pick-Up of Transporters
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DAILY OPERATIONS:

Lincoln Airpark Site Open:

- Wednesday 9:00 a.m. - 7:30 p.m.
- Thursday - Saturday 7:30 a.m. - 7:30 p.m.

Student Registration (Tent):

- Wed. & Thursday 9:00 a.m. - 4:30 p.m.
 - Thursday & Friday 8:00 a.m. - 4:00 p.m.
- Sat. All students will be registered as spectators*

Volunteer Registration & Info (Tent):

- Wednesday -
Saturday. 7:30 a.m. - 4:30 p.m.

Tech Inspection (Danley Bldg):

- Wednesday 1:00 p.m. - 7:00 p.m.
(no new cars after 6:00 p.m.)
- Thursday 8:00 a.m. - 5:00 p.m.
- Friday By appointment until 2:00 p.m.

Scales (Danley Bldg):

- Wednesday 3:00 p.m. - 7:00 p.m.
- Thursday 8:00 a.m. - 5:00 p.m.

Tilt/Noise/Brake:

- Thursday 8:30 a.m. - 5:00 p.m.
- Friday 8:30 a.m. - 5:00 p.m.
(after 2:00 p.m. by appt only)

Fuel Station

- Thursday - Friday 8:30 a.m. - 4:00 p.m.
- Saturday 7:30 a.m. --4:00 p.m.

Practice Area:

- Thursday Noon - 5:00 p.m.
- Friday 8:00 a.m. - 5:00 p.m.
- Saturday 7:30 a.m. - 3:00 p.m.

*NOTE: Cars must complete all 3 parts of tech by 5:00 p.m.
Friday to qualify for Endurance.*

*30 minutes' notice is required for all appointments, which
can be booked through the announcer in Main Tent.*



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MAKING STEEL.

WE'RE ENGINEERING
LEADERS.

*By competing in Formula SAE Lincoln,
you have taken a giant step toward
preparing yourself for the challenges
and opportunities that your future will
present. The next step matters even more.
Find out more at www.nucor.com/careers*



2016 FORMULA SAE® LINCOLN

SCHEDULE OF EVENTS

NOTES

- Drivers Meeting – There will be only one drivers meeting covering all dynamic events at 5:30 pm Thursday. There will be a brief drivers meeting for Brake and Practice at 8:00 am Thursday. Drivers are required to attend driver's meetings. Failure to attend driver's meetings may result in the revocation of your driving privileges.
- Event Closing Time - Acceleration, Skid Pad and Autocross close exactly at the scheduled time. Your car must have crossed the starting line before the event closing time in order to be allowed to complete that run
- Course Walks – Autocross and Endurance will be available to walk starting Thursday @ 2 pm and will be accessible up to the start of the event. Drivers are required to walk the course for each event in which they will be behind the wheel. Course walks will not be scheduled for individual events.
- Removing Vehicles – Vehicles may be taken off site at the individual team's discretion provided Part 1 of the Inspection Sticker has been removed by Tech Chief.
- EMS will provide any/all medical attention.
- All teams not shipping cars must remove their vehicles, etc. from the site no later than 2:00 pm Sunday, June 19, 2016.
- Teams shipping cars must have them picked up and removed from the site by 10:00 am Monday, June 20, 2016.
- Announcements can be heard via FM radio (Frequencies will be posted in the Reg. /Info. Tent).

SUPPORT SERVICES

- **Lincoln Electric Welding Services**
 - Wed. 1:30 p.m. - 5:00 p.m.
 - Th. - Fri. 9:00 a.m. - 5:00 p.m.
 - Sat. 9:00 a.m. - Noon
- **Hoosier**
 - Wed. 1:30 p.m. - 5:00 p.m.
 - Th. - Fri. 9:00 a.m. - 5:00 p.m.
 - Sat. 9:00 a.m. - Noon
- **Food Vendors - See map for location***
 - All days ~8:00 am - 5:00 pm
 - * As business dictates. May close earlier if deemed appropriate.
- **Lincoln Airpark Fire trucks on site:**
 - Wed. - Sat. 7 a.m. - ~8 p.m.
- **Ambulance on site**
 - Wed. - Sat. 7 a.m. - ~8 p.m.
- **Information (Main Tent/Danley Bldg):**
 - Th.-Sat. 7:30 a.m. - 5:00 p.m.

2016 FSAE LINCOLN AWARDS

SPIRIT OF EXCELLENCE AWARD

This award recognizes the Top 10 IC and Top 3 EV finishers with overall highest accumulative scores.

STATIC EVENTS

COST AWARD

This award recognizes the Top 3 IC and Top 1 EV finishers with overall highest accumulative scores in Cost.

ENGINEERING DESIGN AWARD

This award recognizes the Top 3 IC and Top 1 EV finishers with overall highest accumulative scores in Design.

PRESENTATION AWARD

This award recognizes the Top 3 IC and Top 1 EV finishers with overall highest accumulative scores in Presentation.

DYNAMIC EVENTS

ACCELERATION AWARD

This award recognizes Top 3 IC and Top 1 EV finishers with fastest speeds/highest accumulative scores in Acceleration.

AUTOCROSS AWARD

This award recognizes Top 3 IC and Top 1 EV finishers with fastest speeds/highest accumulative scores in Autocross.

ENDURANCE AWARD

This award recognizes Top 3 IC and Top 1 EV finishers with fastest speeds/highest accumulative scores in Endurance.

FUEL EFFICIENCY AWARD

This award recognizes Top 3 IC and Top 1 EV finishers who receive highest scores accumulated on best fuel efficiency.

SKID PAD AWARD

This award recognizes Top 3 IC and Top 1 EV finishers with fastest speeds/highest accumulative scores in Skid Pad.

SPECIALTY AWARDS (These are special created sponsored awards; some may require application process)

THREE VIEW DRAWING EXCELLENCE AWARD - AWARD APPLICATION INFORMATION

Awarded to the top ten Formula SAE teams who submit the best executed three view drawings, per the Formula SAE Rule S6.4. Top 3 teams receive award; teams 4-10 honorable mention.

2016 "PAY FOR PERFORMANCE" AWARD SPONSORED BY NUCOR STEEL

Awarded to the team who best exemplified the ability to balance cost and performance to maximize profitability based on the dynamic points per cost event dollar.

Note: Although not guaranteed, some awards will include a cash award dependent on sponsorship. These and other awards will be detailed in the event program available at the on-site competition registration booth.



2016 FORMULA SAE LINCOLN

REGISTERED TEAMS

BRAZIL

- 11 **Universidade Federal Do Rio Grande Do Su**
RS RACING UFRGS

CANADA

- 10 **Univ of Manitoba**
Polar Bear Racing
- 33 **Univ of British Columbia - Okangan**
UBCO Motorsports
- 47 **Carleton Univ**
Ravens Racing
- 56 **Univ of Alberta**
University of Alberta Formula SAE
- 57 **Univ of Calgary**
Schulich Racing
- 84 **Ecole De Technologie Superieure**
Formula ETS
- 88 **Univ of New Brunswick**
UNB
- 100 **Polytechnique Montréal**
Formule polytechnique Montreal

INDIA

- 68 **Chandigarh Engineering College**
Mechnorobs Motorsports

JAPAN

- 70 **Honda Technical College Kansai**
HTW-09

MEXICO

- 41 **Instituto Tecnologico de Chihuahua**
Panteras Racing Team
- 46 **Universidad Nacional Autónoma de México**
UNAM Motorsports
- 82 **Universidad Panamericana**
UP Racing

SOUTH KOREA

- 86 **Yeungnam College of Science & Tech**
YUC Formula Expedition

UNITED STATES

- 1 **San Jose State University**
Spartan Racing
- 3 **Univ of Illinois - Urbana Champaign**
Illini Motorsports
- 4 **Univ of Kansas - Lawrence**
jAYHAWK mOTORSPORTS
- 7 **South Dakota State Univ**
Wild Hare Racing
- 9 **Louisiana State Univ**
TigerRacing
- 12 **California State Univ - Los Angeles**
Golden Eagle Motorsports
- 14 **Univ of Nebraska - Lincoln**
Husker Motorsports
- 15 **Univ of Oklahoma**
Sooner Racing Team
- 16 **Miami Univ**
Redhawk Racing
- 17 **Western Washington Univ**
WWU Racing
- 18 **Oregon Inst of Tech**
Oregon Tech Racing
- 19 **California State Univ - Sacramento**
Hornet Racing
- 20 **Univ of Calif - Irvine**
Anteater Racing
- 21 **Univ of Calif - Berkeley**
Berkeley Formula Racing
- 22 **Univ of Massachusetts - Dartmouth**
Corsair Racing
- 23 **San Diego State Univ**
Aztec Racing
- 24 **Univ of Wisconsin - Platteville**
UW-Platteville FSAE
- 25 **California State Univ - Northridge**
Matador Motorsports
- 27 **Drexel Univ**
Drexel Racing Gas
- 28 **Univ of Houston - Houston**
Coogs
- 29 **Arizona State Univ - Tempe**
Sun Devil Motorsports
- 30 **Colorado School of Mines**
Mile High Formula
- 31 **Temple Univ**
Temple Formula Racing
- 34 **Univ of St Thomas**
University of St. Thomas Racing
- 35 **Univ of Louisville**
Speed FSAE
- 36 **California State Univ - Long Beach**
Gold Digger Racing
- 38 **Northwestern Univ**
Northwestern Formula Racing
- 39 **Univ of Texas - Austin**
Longhorn Racing
- 40 **Univ of Colorado - Denver**
Lynx Motorsports
- 42 **Wichita State Univ**
Shocker Racing
- 45 **California State Poly Univ - Pomona**
Cal Poly Pomona Formula SAE
- 48 **Texas A & M Univ - College Station**
Texas Aggie Racing
- 49 **Univ of Washington**
UW Formula Motorsports
- 50 **South Dakota School of Mines & Tech**
Formula HardRocker Racing
- 51 **Southern Methodist Univ**
Hilltop Motorsports

- 52 **Southern Illinois Univ - Carbondale**
Saluki Racing
- 53 **Univ of Calif - San Diego**
Triton Racing
- 54 **Univ of Southern California**
USC Racing
- 55 **Univ of North Texas**
Mean Green Racing
- 58 **Univ of New Mexico**
LOBOMotorSports
- 60 **California State Univ - Fullerton**
Titan Racing
- 61 **Saint Louis Univ**
Parks Racing
- 65 **Grand Valley State Univ**
GVSU Formula Racing Team
- 66 **Univ of Illinois - Chicago**
UIC Motorsports
- 67 **Univ of North Dakota**
UND FSAE
- 71 **Oakland University**
Grizzlies Racing
- 72 **Univ of Akron**
Zips Racing
- 74 **Univ of Arizona**
Wildcat Formula Racing
- 75 **Univ of Texas - San Antonio**
Roadrunner Racing
- 77 **Iowa State Univ**
Cyclone Racing
- 78 **Univ of Calif - Los Angeles**
UCLA Formula Racing
- 80 **California State Univ - Chico**
CSU, Chico FORMULA
- 81 **Western Michigan Univ**
Bronco Racing
- 83 **California State Univ - Fresno**
Bulldog Racing
- 85 **Univ of Massachusetts - Lowell**
Mill City Motors
- 89 **Missouri University of Science and Tech**
S&T Racing
- 90 **Kettering Univ**
kettering university motorsports
- 91 **Wayne State Univ**
Warrior Racing
- 92 **Auburn Univ**
War Eagle Motorsports
- 95 **Univ of Toledo**
Rocket Motorsports
- 96 **Rose Hulman Inst of Tech**
Rose GPE
- 97 **Univ of Pittsburgh - Pittsburgh**
Panther Racing
- 98 **Columbia Univ**
Knickerbocker Motorsports
- 99 **Univ of Wisconsin - Madison**
Wisconsin Racing
- 102 **Colorado Mesa University**
Mesa Motorsports

2016 FORMULA SAE ELECTRIC REGISTERED TEAMS

BRAZIL

E211 Centro Universitario Da FEI
FÓRMULA FEI ELÉTRICO

CANADA

E203 Polytechnique Montréal
Poly eRacing

E204 McGill Univ
McGill Formula Electric

E206 Carleton Univ
Ravens Racing Electric

E220 Univ of Manitoba
Polar Bear Racing Electric

E222 Univ of Waterloo
Waterloo Hybrid-Electric

CZECH REPUBLIC

E230 Czech Technical Univ of Prague
eForce FEE Prague Formula

PAKISTAN

**E223 Pakistan Navy Engineering
College**
Formula Electric Racing - NUST

UNITED STATES

E201 Univ of Pennsylvania
PennElectricRacing

**E205 Missouri University of Science
and Tech**
Missouri S&T Formula Electric

E207 Univ of Michigan - Dearborn
UMD Electric Racing

E208 Carnegie Mellon Univ
Carnegie Mellon Racing

E209 Univ of Calif - Davis
Formula Racing at UC Davis

E210 Purdue Univ - W Lafayette
Purdue Electric Racing

**E212 California Polytechnic State
Univ-SLO**
Cal Poly Racing

E213 San Jose State University
Spartan Racing Electric

E214 Univ of Calif - Irvine
Anteater Racing

E215 Massachusetts Inst of Tech
MIT Motorsports

E216 California Institute of Technology
Caltech Racing

E217 Georgia Institute of Technology
HyTech Racing

E218 Olin College of Engineering
REVO Electric Racing

**E219 Univ of Illinois - Urbana
Champaign**
Illini Formula Electric

E221 Portland State Univ
Viking Motorsports

E224 Univ of Texas - Arlington
UTA FSAE

E225 Kennesaw State University
KSU EVT

E226 Univ of Washington
UW Formula Motorsports

E228 Yale Univ
Bulldogs Racing

E229 Univ of Akron
Zips Electric Racing

E235 Univ of Calif - Santa Cruz
Formula Slug

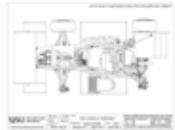
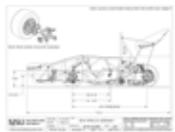
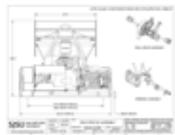


San Jose State University

Spartan Racing



The 2016 Formula SAE competitions mark the eighth consecutive year for San Jose State University's Spartan Racing Formula team. SR-8 is an evolution of SR-7, our 2015 entry that won 1st place overall in Lincoln. SR-8 features a 4130 steel tube frame, 10in Hoosier tires, full aerodynamics package, and is powered by a Honda F4i 4-cylinder engine running on E85. While assessing the 2015 season, we found that the largest gains in vehicle performance were found during the testing phase between Michigan and Lincoln events. We concluded that an emphasis on testing and validation was necessary to repeat the high dynamic scores seen last year.



BRAKE : Tilton 77 MC, Wilwood GP200 Calipers
BSCD : 67mm, 42.5mm, 4, 599cc
COOLING : Dual Core, Dual Pass
DRIVE : Chain Drive, Drexler Limited Slip Differential
ELECTRONICS : DTA S100 ECU, Aim EVO4 DAQ, Student Designed PDU
ENGINE : Honda CBR600 F4i
FR/RR TRACK : 48 in, 47 in
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Single-rail EFI
FUEL TYPE : E85
MATERIAL : 4130 Steel, Carbon Fiber
MPD : 73 HP @ 11,000 RPM
MPT : 37 ft-lbs @ 10,000 RPM
OLWH : 115 in, 56 in, 51 in
SUSPENSION : Front Pullrod, Rear Pushrod, Ohlins Shocks
TIRE : 18x6x10 (Front), 18x7.5x10 (Rear) Hoosier R25B
UNIQUE : Closed Loop Electro-pneumatic Shifting
WEIGHT : 570 lbs
WHEELBASE : 60.5 in



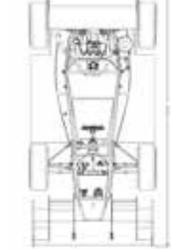
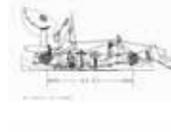
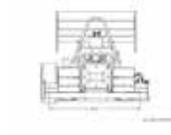
Univ of Illinois - Urbana Champaign

Illini Motorsports



The Illini Motorsports 2016 competition entry has been designed using points analysis-based lap simulation with an enhanced focus on reliability. Key design changes include a new Yamaha R6 powertrain, a new paddle-shifting system, and updates to our custom electronics package.

We would like to thank our friends, families and sponsors for their continued support.

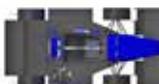
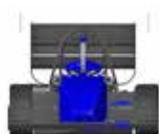


BRAKE : AP Racing 4-Piston Front, 2-Piston Rear
BSCD : 67mm/42.5mm/4/599cc
COOLING : Vertically mounted single core double pass radiator, 1328 com fan
DRIVE : Chain Drive, Wavetrac LSD
ELECTRONICS : Motec M400 and student designed data acquisition system
ENGINE : Yamaha YZF-R6
FR/RR TRACK : 49in front, 49in rear
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Stock Yamaha
FUEL TYPE : 93 Octane
MATERIAL : 4130 Chromoly Steel
MPD : 11,500
MPT : 10,000
OLWH : L: 3109mm/W: 1468m/ H: 1124mm
SUSPENSION : Double unequal length A-arms, Ohlins TTX25 Dampers
TIRE : 20.5x7x13 Hoosier R25B
UNIQUE : Custom airfoils, CFRP string wheel, PDM, Electronic Paddle-Shifting
WEIGHT : 610
WHEELBASE : 64in





WHR-16 is an evolution of last years car. We focused on improving last years design to be more reliable, easier to drive and high performance. Performance is the center of the design with an aggressive aero package, powerful 4 cylinder engine, anti roll bars and wider tires. the engine was developed for a lower peak torque curve to provide a more driver friendly car. the car will incorporate a 3.5" touch screen display and have active launch control and traction control to help the driver push the vehicle.



BRAKE : Tilton 77 series, driver adjustable Tilton bias bar

BSCD : 67mm/42.5mm/4/599cc

COOLING : single radiator with fan shrouding

DRIVE : chain driven

ELECTRONICS : Motec ECU, custom relay board, custom dash

ENGINE : Yamaha r6 06-07

FR/RR TRACK : 51/50 inches

FRAME : laser cut space chromoly steel frame

FUEL SYSTEM : denso injectors

FUEL TYPE : E-85

MATERIAL : chromoly steel, aluminum, Carbon Fiber and maple wood

MPD : 9000

MPT : 8000

OLWH : 110,57,52 inches

SUSPENSION : unequal a-arms

TIRE : 13x20.5x7 R25B

UNIQUE : 3D printed dash board

WEIGHT : 620

WHEELBASE : 64 inches



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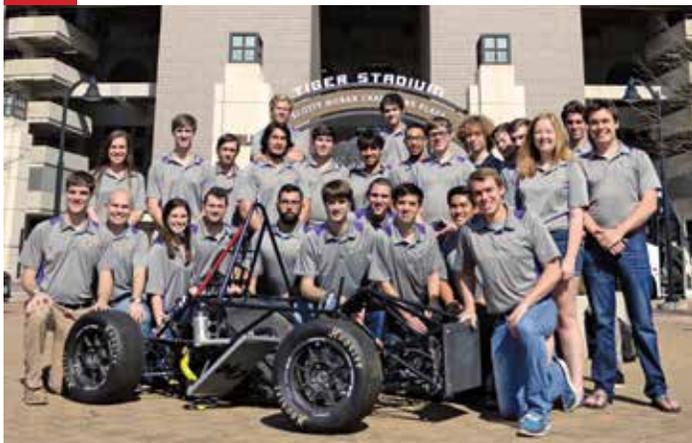
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Go Further

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Louisiana State Univ TigerRacing



LSU TigerRacing is proud of the advancements the team has made in the past four years. This year's car "Kyra" has some minor changes from the 2015 car, most notably a shorter, lighter, and stiffer frame. Our main goals this year were to shed weight from the 2015 car's design, and to use better engineering analysis and design in each subsystem. The car retains the CBR600 F4i power plant, but most subsystems have gone through a new level of refinement above previous LSU cars.



BRAKE : Floating Water Jetted Rotors, Tilton Master Cylinders
BSCD : 67mm x 42.5/ 4 Cylinders/ 599cc
COOLING : Custom C and R Radiator, EWP115 Water Pump
DRIVE : Chain, Drexler Differential
ELECTRONICS : Performance Electronics PE3 ECU, AiM EVO4 Data Logging, AiM G-Dash
ENGINE : Honda CBR600 F4i
FR/RR TRACK : 1244mm/ 1193mm
FRAME : 4130 Tubular Steel Frame
FUEL SYSTEM : Sequential Fuel Injection, Return Style
FUEL TYPE : 93 Octane
MATERIAL : Chromoly 4130 Steel
MPD : 10,000 rpm
MPT : 9,000 rpm
OLWH : 2565mm/ 1444mm/ 1143mm
SUSPENSION : Double Unequal Length A-Arms, Front Pullrod, Rear Pushrod, Öhlins Dampers
TIRE : Hoosier 20.5x7x13 R25B
UNIQUE : One Red Chassis Tube for Baton Rouge ("Red Stick")
WEIGHT : 620 lbs
WHEELBASE : 1600mm



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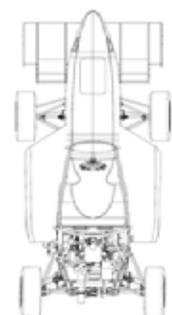
Univ of Manitoba Polar Bear Racing



Polar Bear Racing is excited to present PBR16 at Formula SAE Lincoln. The design philosophy of PBR16 was to build a racecar with strong fundamentals matched with competitive performance. Extra focus has been placed on reliability, serviceability, manufacturing quality, and design validation to ensure the car can achieve the team's goals.

The car features a new CFRP monocoque design that was focused on increasing chassis stiffness and improving quality. The car is powered by a Honda CBR600RR engine running off of E85 and features a rapid prototyped intake, Drexler differential, and a custom power control module. A strong focus has been placed on data acquisition and as a result, the car is equipped with a wide range of sensors for both powertrain diagnostics and vehicle dynamics. The driver experience has also been vastly improved with adjustable pedals, a contoured CFRP seat, custom steering wheel grips, and a new driver interface.

PBR16 is sure to be Polar Bear Racing's fastest car yet and we are very excited to prove it!



BRAKE : Floating Cast Iron Rotors, Tilton Master Cylinders, Wilwood PS-1 Calipers
BSCD : 67mm /42.5mm / 4 / 599cc
COOLING : Water Cooled
DRIVE : Rear Wheel Chain Drive
ELECTRONICS : AEM Infinity ECU, Custom Driver Interface, Custom Power Control Module
ENGINE : CBR600RR
FR/RR TRACK : 1219mm (48in) / 1118mm (44in)
FRAME : CFRP Monocoque
FUEL SYSTEM : Sequential EFI
FUEL TYPE : E85
MATERIAL : Rich Mahogany
MPD : 9500
MPT : 8000
OLWH : 3028mm, 1444mm, 1153mm
SUSPENSION : Unequal length SLA A-Arms with pull-rods and anti-roll bars
TIRE : 18.0x6.0-10 R25B Hoosier
UNIQUE : Cup Holder
WEIGHT : 265.35kg (585lb)
WHEELBASE : 1619mm (63.74in)



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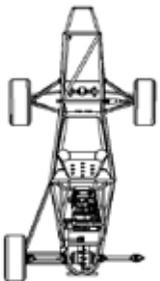
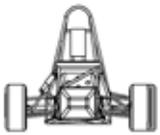
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California State Univ - Los Angeles Golden Eagle Motorsports



The goal for the Golden Eagle Motorsports team was to design a lightweight, high-performance, and affordable race car that could be driven by anyone, regardless of size or skill. The team achieved this by using a continuously variable transmission (CVT) which allows the driver to focus on racing instead of shifting and allows the engine to make peak power through a range of speeds. By using "off the shelf" parts, the team was able to keep the manufacturing cost low. To reduce weight the team designed the vehicle around Hoosier 10inch R25B tires. The gearbox and differential were combined into one housing, reducing the weight of the drivetrain by 50 percent, relative to the previous team. The frame was designed to have the minimum numbers of tubes, which reduced its weight by 30 percent.

The engine is controlled by an AEM EMS-4 standalone ECU that allows for a wide range of tuning options. All a driver needs to operate the AEM is a USB cord and a laptop. Using the AEM, a racer can tune his or her fuel map and ignition map using a number of different sensors.



BRAKE : Solid Rotor, four caliper with dual piston each
BSCD : 2.83in/2.81in/2/35.5cu-in
COOLING : Liquid-cooled
DRIVE : Quality Drive Systems 790 CVT
ELECTRONICS : AEM EMS-4
ENGINE : Honda FSC600a
FR/RR TRACK : (1270/50)/(1320.8/52)
FRAME : 4130 chromoly space frame.
FUEL SYSTEM : Fuel Injected
FUEL TYPE : 91 Octane
MATERIAL : Aluminum fuel tank
MPD : 45 (8000)
MPT : 30 (8000)
OLWH : 108,62,50 (inches)
SUSPENSION : Front (Double A-Arm)/Rear (Multi-link)
TIRE : 18x7.5-10 R25B
UNIQUE : A transaxle combines the gearbox and differential into one housing
WEIGHT : 550lb
WHEELBASE : (1574.8/62)

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Univ of Nebraska - Lincoln Husker Motorsports



Husker Motorsports is a young, but ever-growing team. In its fifth competition year, the team has strived to create a zero-compromise car that is competitive and aesthetically pleasing yet serviceable and simple to manufacture. Instead of making an iteration on the previous design to improve the car incrementally, a decision was made to compile the team's knowledge and re-design from the ground up in order to improve the car drastically. By starting from scratch, the team was able to create an entirely new platform which allowed for the optimal integration of each new design. HMS-05 showcases a streamlined body, two bolt-on rear aluminum chassis plates, modular corner assemblies, and adaptable ergonomics.

Husker Motorsports would like to express our gratitude to the following sponsors for their continued support: Nebraska Ethanol Board, UNL College of Engineering & Department of Mechanical and Materials Engineering, EDSFUND, Kawasaki Motors Manufacturing Co., Royal Engineered Composites, TMC0, Eagle Motorsports, Speedway Motors, and our other gracious donors.



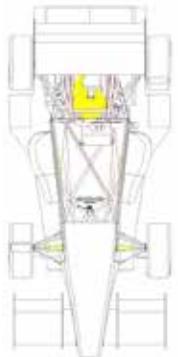
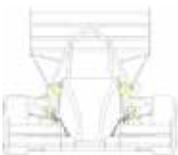
BRAKE : Floating 4130 steel rotors, Willwood caliper, Tilton 77-Series cylinders
BSCD : 67 mm, 42.5 mm, 4 Cylinder, 598 cc
COOLING : Rear mounted 1 core crossflow radiator with 2400 cfm fan
DRIVE : 520 Chain Drive
ELECTRONICS : Megasquirt ECU, AIM EVO 4 DAQ, Ballistic 8 cell EVO2 Battery
ENGINE : Kawasaki ZX-6R
FR/RR TRACK : 1219.2 mm, 1168.4 mm
FRAME : Chromoly Space Frame
FUEL SYSTEM : 3-Bar Batch Port Injection
FUEL TYPE : E-85
MATERIAL : 4130 Chromoly teal, 6061
MPD : 9000
MPT : 8500
OLWH : 2882.9 mm, 1371.6 mm, 1092.2 mm
SUSPENSION : Unequal length double A-Arm, F: pullrod actuation, R: pushrod actuation
TIRE : 18x6-10 R25B Hoosier
UNIQUE : Aerodynamic undertray, Modular corner assemblies, Bolt on rear plates
WEIGHT : 620 lb
WHEELBASE : 1574.8 mm





The 2016 Sooner Racing Team (SRT) undertook two building projects: a team and a car. The first step to both of these projects was to define our goals. The 2016 team was built with two goals: Sustainability and Competence. The 2016 car, Sophia, was designed with three goals: Reliability, Serviceability, and Coherence.

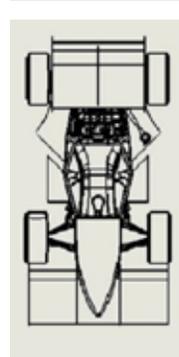
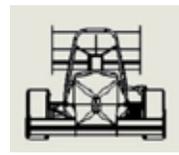
In compliance with these goals, Sophia offers a full aerodynamics package mounted to a high strength steel space frame. A KTM 450 XCW delivers power to the 10" LC0 tires, and a Motec engine management system provides a reliable engine tune and ample data logging for vehicle and driver performance analysis and improvement. Because Racecar.



BRAKE : 4 outboard brakes, floating rotors
BSCD : 95 mm/63.4 mm/1 cyl/449 cc
COOLING : 2 radiators, SPAL fans
DRIVE : Drexler, chain
ELECTRONICS : MoTeC
ENGINE : KTM 450XCW
FR/RR TRACK : 1156 mm/1156 mm
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Return style, internal pump
FUEL TYPE : 91 Octane
MATERIAL : Carbon Fiber, Aluminum, Steel, etc.
MPD : 9500 rpm
MPT : 7000 rpm
OLWH : 2893 mm/1308 mm/ 1149 mm
SUSPENSION : Double A-arm, push rod
TIRE : Hoosier LC0 6.0/18.0-10
UNIQUE : Heated seat
WEIGHT : 227 kg
WHEELBASE : 1588 mm



2016 has brought a number of changes to the design philosophy at Oregon Tech Racing. We are now focusing on solid engineering design backed by numerical validation through the use of hand calculations learned in the classroom and supported through software simulation. We are working toward a robust efficient design, backed by testing and validation. Through the use of iterative design and an understanding of manufacturability and maintainability requirements, Oregon Tech Racing is pleased to bring our best yet to the 2016 Lincoln FSAE event. We are proud present our most reliable, no frills, functional car to date!



BRAKE : Twin piston Wilwood calipers w/floating rotors front, single inboard rear
BSCD : 67mm/42.5mm/4/599cc
COOLING : Sidepod mounted oil and water cooler
DRIVE : Chain
ELECTRONICS : PE3 ECU, No-lift shift pcb, DAQ system
ENGINE : K6 GSXR 600
FR/RR TRACK : 1242mm/1204mm
FRAME : 4130N Steel Spaceframe
FUEL SYSTEM : EFI Semi return-less
FUEL TYPE : 93 Octane
MATERIAL : Steel, aluminum, carbon fiber, fiberglass
MPD : 11,000
MPT : 10,000
OLWH : 3035mm/1445mm/1199.9mm
SUSPENSION : Unequal length, non-parallel A-arms, push and pull rod activated
TIRE : 20 x 7.2-13 Avon A92
UNIQUE : nitrous oxide cooled roots-style blower
WEIGHT : 625
WHEELBASE : 1607mm





The 2016 Hornet Racing team is a group of engineering students from California State University, Sacramento committed to designing and manufacturing a simple yet high quality Formula SAE race car. Building a team with a lot of new members and an active alumni group, the team aims to finish in the top 10 overall, as this team has accomplished finishing a car earlier than any previous team from Sacramento State.

Utilizing the knowledge gained over the past years from alumni and professors, the team has taken an iterative design approach to comprehensively analyze and refine each part of the car. Notable changes include the addition of a dry sump oiling system to improve engine reliability with a revised suspension geometry to reduce weight transfer and to take advantage of the lower center of gravity. Exceptional driver ergonomics accentuated by a custom molded carbon fiber seat, and an emphasis on testing and drivability, gives the driver the confidence to approach the limits of the vehicle.

Hornet Racing would like to thank CSU, Sacramento and all of our sponsors, families and friends for their generous support.



BRAKE : AP master cylinders, Brembo calipers, floating rotors

BSCD : 67.5 mm/42.5 mm/4 cylinders/599 cc

COOLING : Rear mounted radiator, electronic water pump

DRIVE : Chain driven Taylor Race LSD

ELECTRONICS : Microsquirt ECU, Race Technology data acquisition

ENGINE : Honda CBR600RR

FR/RR TRACK : 1220 mm front/rear

FRAME : Tubular steel space frame

FUEL SYSTEM : Honda fuel rail, custom tank

FUEL TYPE : 93 octane

MATERIAL :

MPD :

MPT : 75 hp, 45 lb-ft torque @ 8,500 rpm

OLWH : 2779 mm long, 1438 mm wide, 1263 mm high

SUSPENSION : Unequal length A-arms, front pullrod/

rear pushrod actuate springs/dampers

TIRE : Hoosier 20.5 x 7.0 - 13 R25B

UNIQUE : Custom carbon fiber seat with individual driver inserts

WEIGHT : 630lb

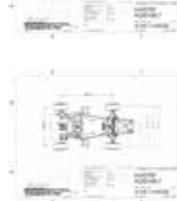
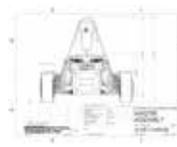
WHEELBASE : 1600 mm



United States



Meet "Savage", the successor of UC Irvine's 2015 racecar, AR-9. Learning from last year's failures, Savage has gained strength in it's brethren's pitfalls and lost weight. A complete aluminum steering assembly, composite seat, data logger, and reduced un-sprung mass have been incorporated while packaging all around the vehicle has been improved. Meanwhile, Savage has revamped yet maintained it's unique WWII-era styling cues with a 3003 aluminum body.



BRAKE : Outboard 7" rotors w/ Wilwood PS1's

BSCD : 65.5mm/44.5mm/4/600cc

COOLING : 2 Single pass heat exchangers

DRIVE : Chain, 3.2:1 final drive ratio

ELECTRONICS : Stock Ecu, Race Technology DL1

ENGINE : 2006 Yamaha YZF-R6s

FR/RR TRACK : 47.22"/46.34"

FRAME : 1020 DOM tubular spaceframe

FUEL SYSTEM : Multi-port EFI

FUEL TYPE : 93 Octane

MATERIAL : 1020 DOM, 304 stainless,

3003/6061/7075 aluminum, fiberglass

MPD : 12,500

MPT : 8,000

OLWH :

SUSPENSION : Double unequal length a-arms w/ front/ rear pushrod

TIRE : Hoosier 6.0/18.0-10 LC0

UNIQUE : 3003 aluminum body

WEIGHT : 650 lbs

WHEELBASE : 63"

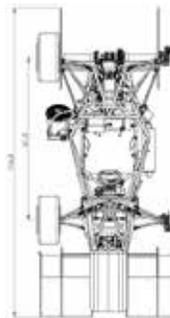
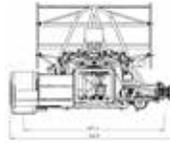


United States



Berkeley Formula Racing returns to Lincoln with another small, single cylinder car. Using our dynamic event simulator, LapSim, we've decided to improve our acceleration event time while improving our aerodynamics package to provide the largest increase in competition points. To improve our acceleration time we switched over to the KTM 350cc SX-F engine. By making a more efficient aerodynamics package, we increased downforce by 30%. We chose a Drexler LSD due to its adjustability and light weight of 4.8 lbs, while adapting the 4340 steel tripod housings to continue using our spring steel flex disc CV joints and carbon fiber axles. B16's suspension was designed using our CnAy model and points sensitivities from our lap simulator.

We chose the KTM 350 over other four-cylinder and higher capacity single cylinder engines because of its high power density and low weight. Commercially available options for single cylinder engines such as the Yamaha and Honda 450 (48HP, 30ft-lbs @ 75lbs and 48HP, 29ft-lbs @ 78lbs, respectively) were determined to be unfit for our vehicle concept because the power gains did not justify the increase in weight.



BRAKE: Tilton Masters, Brembo and Willwood Calipers, Custom cast iron ninja stars
BSCD: 88mm Bore | 57.5mm Stroke | 1 Cylinder | 349.7cc
COOLING: Side mounted radiator with electric fan. Cooled with the tears of our enemies
DRIVE: Single Reduction 520 Chain Drive, Drexler LSD spinning on muffler bearings
ELECTRONICS: MoTeC M400. Powered by black magic
ENGINE: KTM 350 SX-F
FR/RR TRACK: 47in FR | 47in RR
FRAME: 4130 Chromoly Unobtanium
FUEL SYSTEM: Keihin Injector, CRF250R fuel pump, internally regulated anarchy
FUEL TYPE: 100 Octane Martian Blood
MATERIAL:
MPD: 45 HP @ 9350 rpm
MPT: 27 ft-lbs @ 7300 rpm
OLWH: 116.5in x 55.9in x 47.6in
SUSPENSION: Unequal-length A-arm, push rods with independent shocks, and anti-roll bars
TIRE: 18x6-10 R25Bs (Got Hoosiers bro?)
UNIQUE: Spring Steel Flex Discs, Carbon Fiber Composite Axles, and a real clutch
WEIGHT: 359 (plus) 150 = 509
WHEELBASE: 61.3in

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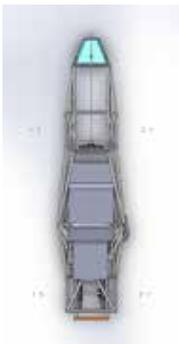
Univ of Massachusetts - Dartmouth Corsair Racing



The 2016 car includes mild improvements over the previous Corsair Racing car. A new engine, provided by a 2006 Suzuki GSX-R 600, is mated to a solid rear axle through a 45-tooth sprocket. Redundant frame bracing has been removed to lighten the structure, and an angle has been added to the front structure to prevent scraping under heavy braking.

Brakes are provided by Wilwood, fuel system from Summit Racing, and CV half-shafts from Honda. New tires were provided by Hoosier and are on 13x7 steel wheels.

Suspension design and analysis was completed using Lotus Engineering's SHARK software package. The front suspension is a double wishbone setup and the rear is pushrod actuated.



BRAKE : Single Cylinder Wilwood
BSCD : 67mm/42.5mm/4 cylinder/600cc
COOLING : 2004 Suzuki GSXR 600
DRIVE : Sprocket/Solid Axle
ELECTRONICS : Stock ECU/Bazzaz zFi Unit
ENGINE : 2006 Suzuki GSXR 600
FR/RR TRACK :
FRAME : Chromoly Welded
FUEL SYSTEM : Fuel Injected
FUEL TYPE : 93
MATERIAL :
MPD :
MPT :
OLWH :
SUSPENSION : Double Wishbone/Pushrod Actuated
TIRE : 13x7 Hoosier
UNIQUE :
WEIGHT : 700lb
WHEELBASE :



United States

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San Diego State Univ Aztec Racing



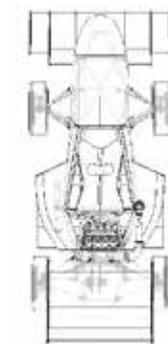
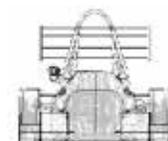
San Diego State University's Formula SAE Racing team, Aztec Racing, is excited to present our 2016 model, the AR-16, this year in Lincoln, Nebraska.

This year Aztec Racing's main focus has been on overall improvement. Priority one went to systems that needed to be corrected (i.e. electrical), priority two went to systems that needed fine tuning and refinement (i.e. suspension), and priority three went to adding new features to improve the overall performance of the AR-16.

Some of the new features of the AR-16 include electronic paddle shifters, carbon fiber intake manifold, and an ergonomically designed steering wheel.

A lot of effort has gone into making the AR-16 lighter, sleeker, and more aerodynamic than any of its predecessors. Aztec Racing has utilized many innovative carbon fiber lay-up techniques to make this happen.

We would like to thank all of our sponsors for your continued support. Special thanks to San Diego State University for giving us the tools we needed to build our best car yet. We couldn't have done it without you!



BRAKE : Wilwood PS-1 calipers, drilled steel rotors
BSCD : 65.5mm/44.5mm/4cyl/599.8cc
COOLING : Single side mounted aluminum radiator
DRIVE : Chain Drive, Taylor Race Mk2 Limited Slip Differential
ELECTRONICS : AEM EMS-4, digital dashboard using CAN data
ENGINE : 2007 Yamaha R6S
FR/RR TRACK : 1193.8mm/1143mm (47in./45in.)
FRAME : DOM Tubular Steel Spaceframe
FUEL SYSTEM : Electronic Fuel Injection, R6S injectors
FUEL TYPE : 93 Octane
MATERIAL : Steel, Aluminum, Carbon Fiber, Aramid
MPD : 80 hp @ 12000 rpm
MPT : 40 ft-lb @ 10000 rpm
OLWH : 3165mm, 1371mm, 1100mm (124.6in, 54.0in, 43.3in)
SUSPENSION : XFusion Coilovers, pushrod actuated
TIRE : 20.5 x 6.0 - 13 R25B Hoosier
UNIQUE : Electronic Paddle Shifters
WEIGHT : 670 lbs (w/ 150 lb driver)
WHEELBASE : 1727.2mm (68in.)

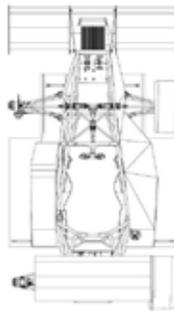
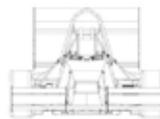


United States

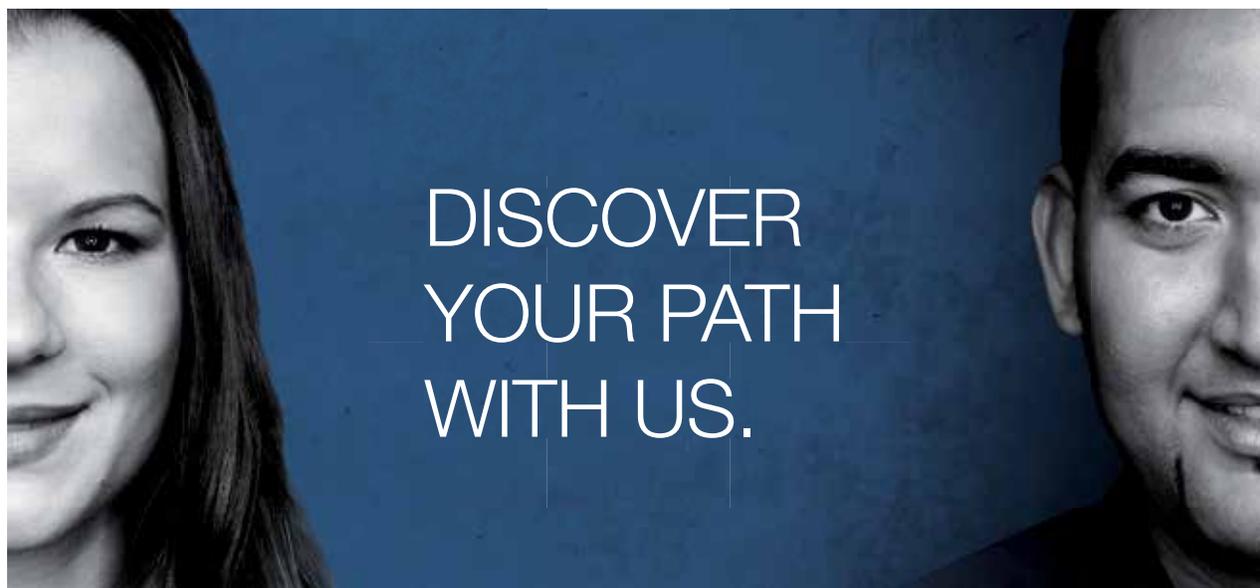


For the 2016 FSAE competition at Lincoln, Matador Motorsport focused on iterating upon the 2015 vehicle to achieve an increase in reliability while keeping the same weight targets. This year, the team prioritized on refining major changes last year made on the 2015 vehicle. The major decisions made was a complete redesign of the drivetrain system and the aero package. A strict design and manufacturing timeline allowed for additional testing and validation of our designs. The design of the aero package was driven by reaching downforce targets, minimizing drag and these factors facilitate increased performance of the vehicle.

One team. One Sound.



BRAKE : 3 Floating 190mm Diameter Brakes, Wilwood Calipers
BSCD : 100mm Bore / 65mm Stroke / 1 Cylinder / 510cc
COOLING : Dual-Pass Aluminum Radiator w/ Fan
DRIVE : Chain Drive
ELECTRONICS : Microsquirt
ENGINE : CRF450X
FR/RR TRACK : Front: 1,295mm / Rear: 1,245mm
FRAME : Steel Space Frame
FUEL SYSTEM : Honda Internal Fuel Pump Assembly; Bosch EV14 Fuel Injector
FUEL TYPE : 100 Octane
MATERIAL : 4130 Chromoly Frame, 7075 Al Uprights, Carbon Fiber Wheels/Suspension
MPD : 7600
MPT : 6300
OLWH : 2,793mm, 1,512mm, 1,200mm
SUSPENSION : Double Unequal A-Arm Pushrod Suspension
TIRE : 6.0/18.0-10 R25B
UNIQUE : Shaftless throttle body, carbon fiber wheels, custom differential housing
WEIGHT : 475 lbs
WHEELBASE : 1549mm



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The 2016 University of Houston Formula SAE Team is a first year team competing in Lincoln, Nebraska. Having no prior designs to improve upon, our plan is to pass tech inspection and compete in all dynamic events, while simultaneously building a solid foundation for future teams at our institution in the process.

Design Goals

Safety: The vehicle must pass technical inspection without making major revisions.

Reliability: The vehicle must compete in all dynamic events.

Simplicity: The vehicle must avoid complex systems and be easily repairable.

FSAE at UH would not have been able to get this far without the help of its generous sponsors. Thank you!



BRAKE : Dual Piston Calipers, Composite Metallic Discs.

BSCD : 95/63.4/1/450

COOLING : 2 Radiator

DRIVE : Chain

ELECTRONICS : OEM

ENGINE : 2014 KTM 450 SX-F

FR/RR TRACK : 1094.74mm/1084.58mm

FRAME : Chromoly Space Frame

FUEL SYSTEM : Return Style System

FUEL TYPE : 93 Octane

MATERIAL : Aluminum

MPD : 8000

MPT : 8000

OLWH : 3144mm/1270mm/1250mm

SUSPENSION : Double Wishbone A-arms, damper directly mounted (front), pushrod act (rear)

TIRE : Hoosier 18 x 6 - 10, R25B

UNIQUE : N/A

WEIGHT : 600 lb

WHEELBASE : 60.5 in

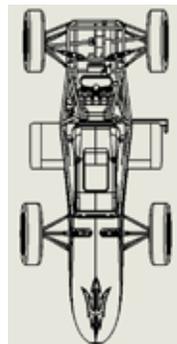
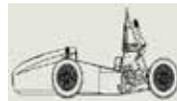


United States



This year's formula vehicle was the culmination of the hard work of a number of dedicated members. A select few members from Sun Devil Motorsports attended the 2015 Lincoln Formula SAE competition which was the first time an Arizona State University team competed in three years. Attending competition was an informative and rewarding experience that inspired us to improve in all aspects of design, manufacturing, and management.

Our focus for our 2016 vehicle, the SDM-16, was drawn from the combined experiences from last year's competition to incorporate proper engineering processes that iterated on the design and construction of the car. This allowed for the production of a quality product with many improvements from SDM-15. Testing was a key aspect in the mission of this build to ensure reliability and optimum performance.



BRAKE : Brembo P34c Calipers ; Tilton 76 Series

Master Cylinders ; Custom Rotors

BSCD : 67mm / 42.5mm / 4 / 599 cm³

COOLING : Side Mounted Custom Sized Radiator

DRIVE : Chain Driven Taylor Limited Slip Differential

ELECTRONICS : Performance Electronics PE3 ECU ;

AIM Solo DAQ System

ENGINE : Honda CBR600 f4i

FR/RR TRACK : 1257mm / 1219mm | 49.5in / 48in

FRAME : 4130 Chromoly Steel Space Frame

FUEL SYSTEM : Electronic Injection ; Custom Fuel Rail

FUEL TYPE : 93 Octane

MATERIAL : 4130 Chromoly Steel

MPD :

MPT :

OLWH :

SUSPENSION : Double Unequal Length A-arms ; Push-rod Actuated Springs and Dampers

TIRE : Hoosier 20.5x7.0-13 ; R25B

UNIQUE : Custom Shift Drum ; Variable Plenum Volume ; Pneumatic Shift System ;

WEIGHT : 610 lbs

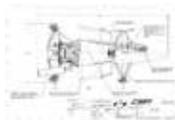
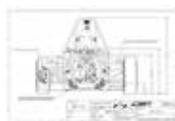
WHEELBASE : 1626mm / 64in



United States



The 2015-2016 CSM Formula race car features numerous improvements over the previous year's design in simplification, weight, machinability, and ergonomics. A full car weight of no more than 226 kg, center of gravity less than 250 mm above ground, in-house machinability, and design simplicity were kept in mind for each subsystem. Our car features unequal, non-parallel double a-arm suspension design on both the front and rear axles. Both front and rear suspensions actuate the coil over dampers through push/pull rods. Both front and rear suspensions also have custom built sway bars. The chassis-to-wheel connection features 2-piece, aluminum alloy uprights and wheel hubs. Our car is powered by a 2008 Honda CBR600RR engine with student built intake and exhaust systems. We replaced our dry sump system from the previous year with a custom machined aluminum low-profile wet-sump oil pan. The car uses a Quaife helical gear, automatic torque biasing, limited slip differential. The frame of the car is composed of two separate sections; an alloy steel tube space frame and an aluminum sub-frame bolted to the rear of the space frame. The car also features carbon fiber reinforced plastic bodywork.



BRAKE : Steel rotors, Wilwood calipers, and Tilton 77 series master cylinder
BSCD : 67mm/42.5mm/4/599cc
COOLING : Side mounted 1 core Aluminum radiator with 2200 cfm fan
DRIVE : Rear wheel drive, chain-to-differential
ELECTRONICS : PE3 ECM and AiM EVO4 Data Logger and G-Dash
ENGINE : Honda CBR600RR
FR/RR TRACK : 1244.6mm/1219.2mm
FRAME : Alloy steel tube space frame
FUEL SYSTEM : Sequential port injection with PE3 fuel mapping and injection control
FUEL TYPE : 93 octane
MATERIAL :
MPD : 10000
MPT : 7000
OLWH : 3079mm, 1377mm, 1080mm
SUSPENSION : Unequal length, non-parallel double a-arm
TIRE : 20.5" X 7.0"-13, R25B for front and rear
UNIQUE :
WEIGHT : 650 lb
WHEELBASE : 1625.6mm



United States



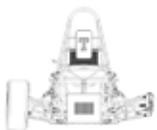
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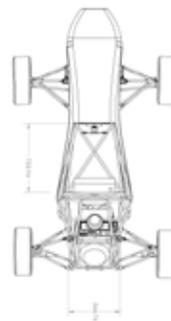
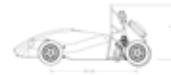
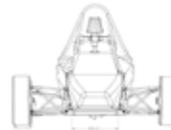
Temple Formula Racing's Mk-V is the organization's fifth entry for competition. Our goals for the 2016 season were focused primarily on creating a user-friendly, reliable and lighter weight vehicle. Shedding unnecessary weight and transitioning to more durable parts has increased the Mk-V's overall performance, ensuring a more harmonious driving experience. Heavy integration of CAD modeling allowed for better packaging and systems Integration. New software suites, such as Altair's HyperWorks, allowed for parts to be easily optimized into lighter and stronger components. Extensive carbon fiber use in the body work, as well as with functional components such as the intake plenum and steering wheel, also contributed to lightweight components. The Mk-V has a more a simplified design that highlights our team's implementation of weight saving and higher quality components, while remaining price conscientious. All in all, the Mk-V represents a significant leap forward in terms of performance and reliability.



BRAKE : All wheel Brembo P34C brake calipers/cross drilled mild steel floating rotors
BSCD : 65.5/44.5mm/4cyl/599cc
COOLING : Water Cooled
DRIVE : Chain Driven taylor race LSD
ELECTRONICS : Performance Electronics PE3
ENGINE : Yamaha YZF-6R
FR/RR TRACK : 50in/48in
FRAME : 4130N Chromoly Space frame
FUEL SYSTEM : EFI, walbro fuel pum Custom Aluminum fuel tank
FUEL TYPE : 93 Octane
MATERIAL : Steel, Aluminum, Carbon Fiber
MPD : 8,950rpm
MPT : 8,325rpm
OLWH : 114.3in/63in/49.6in
SUSPENSION : Double unequal length A-Arms front/rear pushrods
TIRE : Hoosier R25B 20" by 7.5"
UNIQUE : Carbon Fiber Intake Plenum, adjustable pedals
WEIGHT : 640 W/ Driver
WHEELBASE : 68.5in



UBCO Motorsports is a first year team from Kelowna BC, Canada. Our primary focus this year was to develop a foundation from which future generations could build. Our design approach for the OgopoGo-16 (OG16) was to develop a simple and robust platform using proven principles. The space frame chassis is constructed from 4130 Alloy steel. The suspension features unequal length double wishbones at each corner using pull-rods in the front and push in the rear. The naturally aspirated cbr600rr motor is mounted using a subframe to allow for quick and easy adaptation for different motors. As part of developing a knowledge base the OG16 also features composite components such as the steering wheel and pedals.

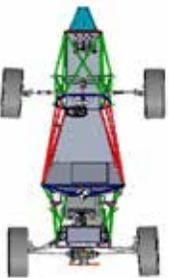


BRAKE : 9" rotors, dual 23mm MC, 4 piston front, single piston rear
BSCD : 67(mm)/42.5(mm)/4/599 (cc)
COOLING : Liquid
DRIVE : 6sp manual/Chain drive
ELECTRONICS : Haltech ECU, AiM MXL Strada
ENGINE : '07 CBR 600RR
FR/RR TRACK : 1580/1560 (mm)
FRAME : 4130 Chromoly Tubular Space Frame
FUEL SYSTEM : Multipoint fuel injection
FUEL TYPE : Gas 94 octane
MATERIAL : 4130 steel
MPD : 49 kW (8000rpm)
MPT : 47 Nm (7000rpm)
OLWH : 2800, 1720, 1215 (mm)
SUSPENSION : pull rod front, push rod rear w/ coil-over
TIRE : 20.5x7-13 R25B
UNIQUE :
WEIGHT : 650lbs
WHEELBASE : 1875 (mm)





The 2016 University of Saint Thomas Racing Team has re-designed its 2015 vehicle to utilize a narrower wheel base and to increase the steering performance. While re-using many of the major components, the main goal of this year was to improve the steering and suspension, reduce the weight and the wheel base, and implement better documentation processes. The steering torque ratio has improved from 1:1 to. The team reduced the electronics package to fit into a smaller space. The car's suspension geometry has changed to accommodate a new wheel package while also improving the kingpin angle and scrub radius. The design of the fully adjustable double unequal non-parallel a-arms was improved to be more easily adjustable in competition settings. The redesigned frame allows for better driver visibility and a more comfortable upright seat position. All design work has been documented for future generations of our program.



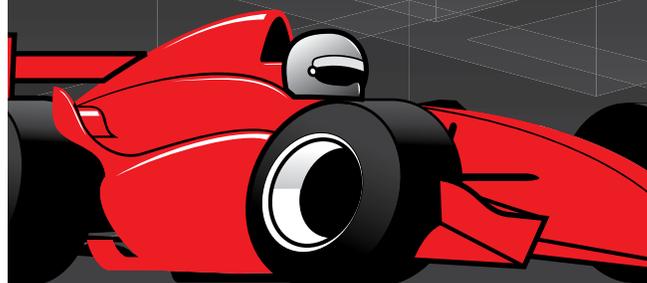
BRAKE : Wilwood GP200 and Dynalite Singles with floating rotors
BSCD : 67mm / 42.5mm / 4 cylinder / 599 cc
COOLING : Rear mounted single aluminum radiator
DRIVE : 520 Chain drive
ELECTRONICS : Micro Squirt V3
ENGINE : Honda CBR600RR
FR/RR TRACK : 1683 / 1564 (66.26 / 61.575)
FRAME : 4130 DOM Chromoly steel
FUEL SYSTEM : Fuel Injected, external fuel pump and regulator
FUEL TYPE : 93 Octane
MATERIAL : 4130 Chromoly Tubing
MPD : 10000
MPT : 7000
OLWH : 2832 mm/ 1542 mm /1128 mm
SUSPENSION : Unequal Length a-arm w/ front push rod and rear pull rod springs and dampers
TIRE : Hoosier 20.5 x 7 - 13 R25B
UNIQUE : 3D Printed Air Intake Manifold
WEIGHT : 650 lbs
WHEELBASE : 1648 mm



United States

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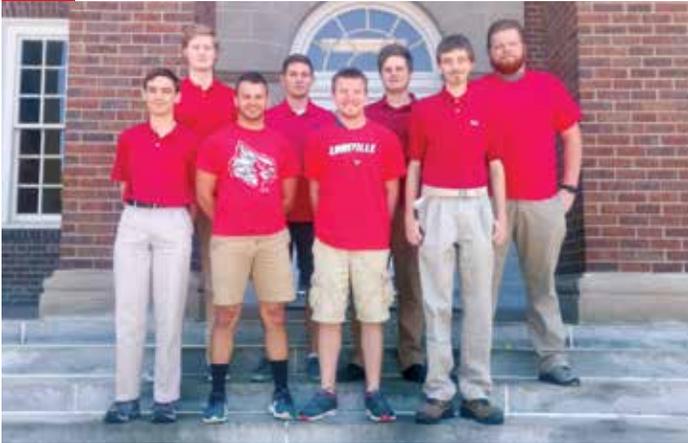
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We are the Formula SAE team from the University of Louisville's J.B. Speed School of Engineering. Here at Speed FSAE, we have assembled a small yet devoted group of students who are passionate about designing and building vehicles. This year our goals were simple and our hopes held high. We wanted to design and build our first FSAE vehicle, compete in every event, and finish each event with decent times.

Those goals have driven the design of the car to be simple yet robust. With little experience the team has spent much of the season researching the correct way to design and build the vehicle. The team has decided to build a sturdy and reliable car this year, which will allow the team to do iterative improvements on it for years to come. This will also give the team an excellent test vehicle for future research and development ideas.

We would like to thank all the sponsors and volunteers who help make this event possible. We cannot wait to see you out on the track.



BRAKE : Wilwood Master Cylinders and Calipers

BSCD : 67/42.5/4/600

COOLING : Radiator with cooling fan

DRIVE : Chain Drive

ELECTRONICS : PE3 Performance Electronics ECU

ENGINE : Honda CBR600RR

FR/RR TRACK : 1143/1219

FRAME : Steel space frame

FUEL SYSTEM : OEM Fuel system with custom fuel tank

FUEL TYPE : 93 Octane

MATERIAL : Steel and Carbon Fiber

MPD : 7000

MPT : 7000

OLWH : L:2743, W:1422, H:1303

SUSPENSION : Short-Long arm with push rod and stabilizer bar

TIRE : 20.0x7.5x13, R25B, Hoosier 43613

UNIQUE :

WEIGHT : 650 lbs

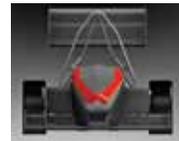
WHEELBASE : 166 mm wide



United States



The Longhorn Racing team has focused on a reliable car this year. We have carried this goal out through redesign of only critical components that have encountered issues during testing in the past. This ensured an early completion of the car with maximum testing time. The components that saw a large redesign were several parts in the drivetrain including the differential housing and pillow block assembly as well as the cooling system and a number of critical ergonomic components.



BRAKE : 10" Rotors Wilwood Calipers

BSCD : 67/42.5/4/599

COOLING : Dual Radiator

DRIVE : 520 RV3 Chain

ELECTRONICS : Performance Electronics ECU

ENGINE : Honda CBR 600RR

FR/RR TRACK : 1283/1232 mm

FRAME : tubular space frame

FUEL SYSTEM : Steel braided hose

FUEL TYPE : 93 octane

MATERIAL :

MPD : 69 HP at 8500 rpm

MPT : 45 ft-lb at 8500 rpm

OLWH : 3073/1461/1245 mm

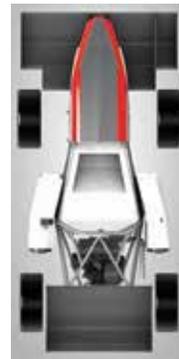
SUSPENSION : Double Unequal a-arm

TIRE : 20.5x7.0-13 R25B Hoosier

UNIQUE :

WEIGHT : 600 lb

WHEELBASE : 1600 mm



United States

40

Univ of Colorado - Denver

Lynx Motorsports

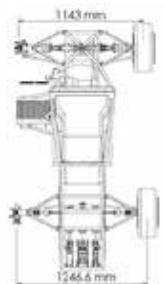
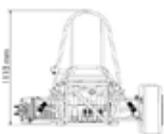


Lynx Motorsports is proud to present LX216, the sophomore vehicle from the University of Colorado Denver. Building off of last year's momentum, the LX216 offers a robust yet intuitive driving experience.

Opting for a single cylinder engine drove our design towards a lightweight, ultra-compact, and simple package. And being from the mile high city Denver, our engine boasts the best cardiovascular strength at the competition.

Lynx Motorsports is a program where a completely new team builds a new car every year, and although we are still in our infancy stage at the competition, we hope to become a consistently competitive university for years to come.

We'd like to thank our faculty, family, and significant others/spouses for sticking with us through this arduous process. And of course a special thanks to all of our sponsors!



BRAKE : Single Caliper Disk brake
BSCD : 94 mm Bore / 66.6 mm Stroke / Single cylinder / 462 cc
COOLING : Aluminum radiator w/fan
DRIVE : Rear wheel chain drive, Drexler LSD
ELECTRONICS : Microsquirt ECU, MoTec C125
ENGINE : Suzuki DR-Z400SM
FR/RR TRACK : Front: 1246.6 mm / Rear:1143 mm
FRAME : 4130 Steel Tube Space Frame
FUEL SYSTEM : EFI
FUEL TYPE : E85 Ethanol
MATERIAL : Aluminum, Carbon fiber, Aramid fiber, Al honeycomb, plastics
MPD : 47 hp @ 8000 RPM
MPT : 38 ft-lbs @ 5000 RPM
OLWH : 2950 mm x 1500 mm x 1118 mm
SUSPENSION : Independent SLA
TIRE : 18 x 7.5-10, R25B Hoosier
UNIQUE : Carbon Fiber intake, Quick-adjust pedal tray, CFRP steering wheel
WEIGHT : 550 lbs
WHEELBASE : 1574.8 mm



United States

41

Instituto Tecnológico de Chihuahua

Panteras Racing Team



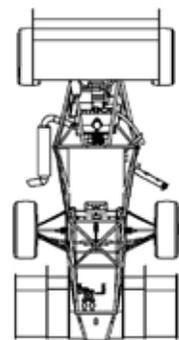
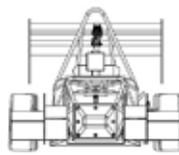
It is our 14th project, where ideas were included. Manufacturability, reliability and drivability were chosen to get our principal goal, and what is it? Get the maximum weight reduction without sacrificing performance and increasing to a maximum the experience of the driver. So, this is a redesign of our last successful race car, data from past projects and mistakes of a lifetime. We are introducing our first aero package, a dream that never has become until this day, taking a machine of four wheel with no more than 1000 hp of enthusiasm and 599 cc of pure power.

A new data acquisition system compatible with platforms of Android, IOS and Windows, always keeping in tune the entire systems of the car. New sensing technology to watch the behavior of the suspension systems thanks to our development board with the integration of few accelerometers, and a continue status of our CBR600RR engine, always trying to fit it to a best condition. Is more than a car...

Is a team making a dream comes true.

Making a step to the future, and...

Is a machine leaving a mark in this world.



BRAKE : Four outboard floating rotor brakes
BSCD : 67/42.5/4/599
COOLING : Left side mounted radiator, single core crossflow
DRIVE : Chain driven Zexel torsen T1 differential
ELECTRONICS : ECU Haltech Sport 1000
ENGINE : Honda CBR600RR
FR/RR TRACK : 1320.8mm/1295.4mm
FRAME : Tubular steel space frame
FUEL SYSTEM : Stock fuel injection system
FUEL TYPE : 93 Octane
MATERIAL : AISI 4130 Chromoly steel, 6061 T6 Aluminum
MPD : 9000
MPT : 6500-9000
OLWH : 3031.71mm/1549.4mm/1300.69mm
SUSPENSION : Double unequal A-arms push and pull rod actuated springs and dampers
TIRE : 20.5x7.0-13 R25B Hoosier
UNIQUE : 3D printed intake system, aero package, data acquisition system
WEIGHT : 665lb
WHEELBASE : 1574.8mm



Mexico

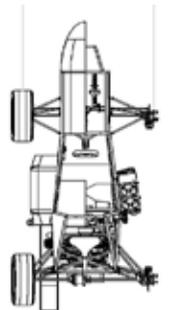
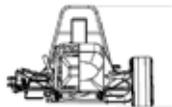
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Wichita State Univ Shocker Racing



Shocker Racing had 3 main overall design goals for the 2016 FSAE competition. First the team focused on improving the reliability of the SR vehicle model. In order to achieve this goal, minimal design changes were implemented from the previous year's car to facilitate increased testing time for design validation. Second, the team reduced the weight of the car to a total 218kg wet. Third, the team wanted to greatly increase the ease of manufacture and maintenance through repeatable processes and leaner manufacturing. The result of these design goals is SR16.

SR16 utilizes a 32 kg steel space frame for the main structure and chassis of car. The aerodynamics include an under tray resulting in downward force and drag of 32 lbs. and 23 lbs. respectively. SR16's suspension and steering utilizes an unequal a-arm design in both the front and rear with an emphasis on maximizing tire grip. The controls employ the use of adjustable pedals to accept a wide range of drivers. SR16's drivetrain incorporates a Honda CBR600RR power plant with a Performance Electronics PE3 engine management system, tuned intake and exhaust, and 2 stage dry sump oil system.



BRAKE : Tilton 77 Series Master Cylinder, Wilwood Calipers, Bias bar
BSCD : 67mm / 42.5mm / 4cyl / 599 cc
COOLING : Right side mounted 2195cm³ core single pass radiator , 2 300 cfm fan mounted to fan shroud
DRIVE : Chain-Driven, Taylor Race Differential
ELECTRONICS : PE3 ECU, MoTec PDM 15, AIM Evo4
ENGINE : Honda CBR600rr
FR/RR TRACK : 1270mm/1270mm
FRAME : 4130 Chromoly Tubular Spaceframe
FUEL SYSTEM : Electronic Fuel Injection
FUEL TYPE : 93 Octane
MATERIAL : 4130 Steel, 7075/6061 Aluminum, Carbon Fiber, Kevlar
MPD : 11,300 rpm
MPT : 8,850 rpm
OLWH : 2921 mm, 1473.2 mm, 1054.1 mm
SUSPENSION : Unequal length double A-arm, Pull-rod actuation, coil spring, torsion ARB, 4-way adjustable dampers
TIRE : 20.5x7.0 -13, R25B Hoosier
UNIQUE : Adjustable Pedals, Mil-spec Wiring, Diffuser, Molded Foam Seat
WEIGHT : 630 lbs
WHEELBASE : 1651 mm

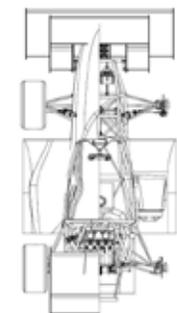
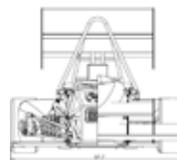


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California State Poly Univ - Pomona Cal Poly Pomona Formula SAE



Cal Poly Pomona Formula SAE is proud to show its 2016 Formula SAE vehicle. With an incremental improvement over the previous car the team is looking for the podium. The major additions to the new vehicle include an electronic throttle body, LCD display on the dash, and an electronically actuated shifting system. An increase in downforce and a reduction in weight should allow the 2016 car to be Cal Poly Pomona's most competitive car yet.



BRAKE : 4 Wheel Outboard Floating Disk Brakes
BSCD : 67 mm / 42.5 mm / 4 cyl / 599.4 cc
COOLING : Sidepod-mounted Heat Exchanger
DRIVE : Chain Drive
ELECTRONICS : AEM Infinity
ENGINE : YZF-R6
FR/RR TRACK : 1250 mm / 1220 mm
FRAME : 4130 Chromoly
FUEL SYSTEM : EFI External Pump
FUEL TYPE : E85
MATERIAL : Carbon Fiber Aero, Bodywork, Seat, and Steering Wheel
MPD : 43 kW @ 9000 RPM
MPT : 38 Nm @ 7000 RPM
OLWH : 2950 mm / 1480 mm / 1150 mm
SUSPENSION : Double Unequal Length A-Arm, Pushrod
TIRE : 18 x 7.5 x 10, R25B Hoosier
UNIQUE : Electronic Throttle, Custom LCD Dash
WEIGHT : 600 lbs
WHEELBASE : 1550 mm



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Universidad Nacional Autónoma de México UNAM Motorsports

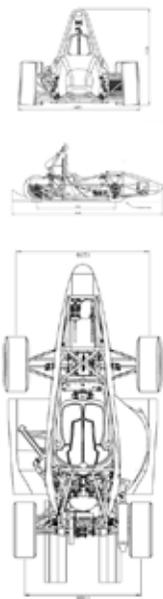


As the best Mexican team at FSAE, UNAM Motorsports designs the seventh prototype with the great dedication of their 34 members which represent their university and their country.

We introduce the... "Exciting Blue"

The UM-467 is a redesign of the previous car because the team's goal was to have at least 4 month of testing in order to obtain as much data as possible to understand the behavior of the car and to able to tune it properly.

We are very grateful with all our sponsors, family and friends which believe in this year's team. You make this dream possible.



BRAKE : Fully floating, 4mm steel gray vented Rotor, double piston caliper
BSCD : 67/42.5/4/599cc
COOLING : Single air-water radiator
DRIVE : Sequential gearbox, chain transmission, semi automatic shift, paddle shifter
ELECTRONICS : PE3 sbRIO 9631
ENGINE : Yamaha R6R "El Macho"
FR/RR TRACK : 1270/1100 mm
FRAME : Steel Space-frame A-36 TIG Welding
FUEL SYSTEM : Sequential multiport fuel injection
FUEL TYPE : Gasoline 100 octane
MATERIAL : Aluminum
MPD : 106.6 HP @ 9565 rpm
MPT : 58.9 Nm @ 9530 rpm
OLWH : 3024/1493/1178 mm
SUSPENSION : Double A-arm with Anti-roll Bar
TIRE : Hoosier Tire Road Racing Slick - Bias 20.5 X 7.0-13 R25B C2500
UNIQUE : Clutch Lever/Data Acquisition//Diffuser
WEIGHT : 614 lb
WHEELBASE : 1575 mm

47

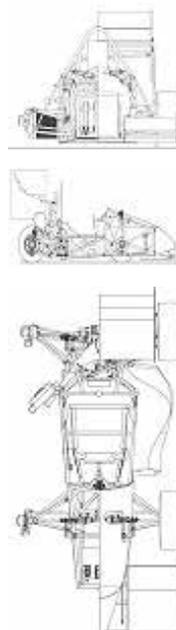
Carleton Univ Ravens Racing



Carleton University's Ravens Racing has designed and produced a high-performance race car making it an ideal weekend race vehicle targeting the amateur autocross enthusiast.

Design highlights for the 2016 vehicle include: single cylinder EFI engine for performance and reliability; customizable fuel and ignition system; full carbon fiber suspension; 3D printed fuel tank; and lightweight aerodynamic package.

Carleton's design goals emphasize a balance between performance and cost-effective manufacturing. To achieve the design goals, a closed loop design process is used to create an environment of continuous improvement. Design criteria are based on the lessons learned in testing and past competitions. A wheels-in design approach is supported by Creo Parametric solid modelling, Creo Simulate FEA, and Creo Mechanism dynamic simulation. Vehicle testing is used to verify criteria compliance and provide feedback for future design work, thus completing the design cycle.



BRAKE : Cast iron floating rotor / AP master cylinders / Wilwood calipers
BSCD : 95.0mm / 63.4mm / 1 cylinder / 450cc
COOLING : Liquid cooled
DRIVE : 5 speed chain drive, custom Honda differential
ELECTRONICS : MoTeC M48 ECU and SPD-i Spark Plasma Ignition
ENGINE : KTM 450 SX-F
FR/RR TRACK : 1219mm / 1168mm
FRAME : Steel space frame
FUEL SYSTEM : Fuel injected
FUEL TYPE : 93 octane
MATERIAL : 1020 steel
MPD : 8500
MPT : 7000
OLWH : 2842mm / 1418mm / 1165mm
SUSPENSION : Double A-Arm, pushrod actuated spring and damper, u-bar ARB
TIRE : Hoosier 18.0x6.0-10 LCO
UNIQUE : 40 inch main hoop
WEIGHT : 225kg
WHEELBASE : 1549mm



Mexico



Canada

48

Texas A & M Univ - College Station

Texas Aggie Racing



Texas A&M's design approach for 2016 was to maximize performance while keeping costs moderate and providing excellent reliability and adjustability. Design choices were made accordingly, across all sub-teams, with the ambition to be competitive dynamically and develop a promising business approach for the racecar.

As is tradition, Texas A&M's design team is comprised entirely of senior-level engineers who, prior to this fall semester, had minimal or no exposure to Formula SAE and had not designed any components for the school's previous cars. This fosters an entrepreneurial culture that focuses on fundamental engineering design and thorough knowledge development that sets us apart from the competition.

As many components as possible, on this year's car, were machined or produced in-house by team members. As a result, the team possesses a strong appreciation for challenges related to designing for manufacturability and assembly. Examples of components made in-house include: uprights, hubs, steering wheel, data acquisition system, seat, front and rear wings, intake, headers, sprocket carrier, rockers and brake rotors.



BRAKE : Four Outboard Discs w/ Brembo Calipers
BSCD : 67 mm / 42.5 mm / 4 cylinders / 599 cc
COOLING : Water
DRIVE : Chain, Drexler Limited Slip Differential
ELECTRONICS : PE3 ECU, LiFePO4 Battery, Custom DAQ and Dashboard
ENGINE : 2010 Honda CBR 600RR
FR/RR TRACK : 50 in (1270 mm) / 49 in (1244.6 mm)
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : External Fuel Tank w/ Pump
FUEL TYPE : 100 Octane
MATERIAL : Steel, Aluminum, Carbon Fiber, Kevlar, ABS, etc.
MPD : 80 hp @ 10650 rpm
MPT : 44 ft-lb @ 10650 RPM
OLWH : 102.8 in (2611.9 mm) / 59 in (1498 mm) / 42.5 in (1079.5 mm)
SUSPENSION : SLA, Front and Rear Pushrod, Öhlins TTX25 Dampers, Adjustable Anti-Roll Bar
TIRE : Hoosier 20.5" x 7" x 13" R25B
UNIQUE : Adjustable Pedals, Multi-Element Aero, Custom Wheel, Seat, and Intake
WEIGHT : 610 lb
WHEELBASE : 60.25 in (1530.4 mm)



United States

49

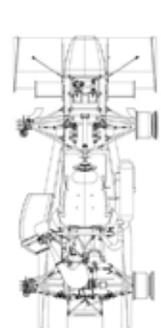
Univ of Washington

UW Formula Motorsports



For 27 years the University of Washington Motorsports team has produced world class race cars. This year, our fourth year as a combined electric and combustion team, the combustion car has gone through a complete redesign. With a brand new for 2016 chassis and aero design, and an evolutionary approach to our powertrain and suspension, the UWFM is poised to return to the winner's circle at Formula SAE Lincoln. Our clean sheet chassis design was approached with an increased focus on ergonomics and weight reduction, all while retaining similar stiffness targets to past monocoque designs. Our all new aerodynamics package takes advantage of an unsprung undertray and all new wing profile designs to increase downforce by 40%. Utilizing in house competition simulation software and structural analysis we have iteratively designed our suspension package to both decrease weight and compliance. After months of testing on our in house engine dyno, we have settled on an engine package that increases power by 30% while still remaining well under the new, aggressive DBC sound limits.

We would like to thank our university, sponsors, family, and friends for making our 1,679 mile journey!



BRAKE : Floating cast iron rotors, Tilton 77 series master cylinders, Brembo/AP cali
BSCD : 99mm/68.5mm/1/478.22cc
COOLING : Side mounted aluminum core C
DRIVE : 520 Chain drive, Drexler LSD
ELECTRONICS : ECU controlled clutch and DRS, load cells, 1 MB CAN bus, wireless telemetry
ENGINE : 2014 Yamaha YFZ-450R, bored to 478.22cc
FR/RR TRACK : 1219.2mm(48 in)/1143mm(45 in)
FRAME : Full carbon fiber/aluminum honeycomb monocoque
FUEL SYSTEM : Siemens Deka VII Injector (2-4 cone elliptical, CFRP tank
FUEL TYPE : 92 (R M)/2 Gas
MATERIAL : Toray T700S/T700G PW/UD (2510 resin), CYTEC FM73 adhesive, PLASCORE al.
MPD : 46.2 kW @ 8200 RPM
MPT : 46 Nm @ 6000 RPM
OLWH : 2870.2mm (113 in)/1422.4mm (56 in)/1117.6mm(44 in)
SUSPENSION : Double unequal length A-arm, push/pull rod actuated
TIRE : 6.0/10.0-10 Hoosier LCO
UNIQUE : P-51 Mustang inspired livery design
WEIGHT : 490
WHEELBASE : 1562.1mm (61.5 in)



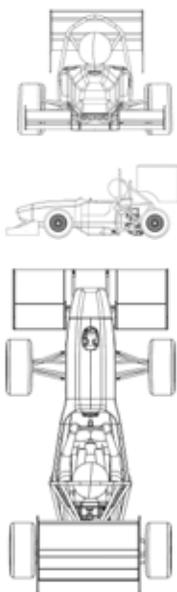
United States

50

South Dakota School of Mines & Tech Formula HardRocker Racing



At the core of our design philosophy was the minimization of vehicle mass, requiring the use of advanced materials and manufacturing techniques. For 2016, a considerable investment was made in the design and manufacture of the primary structure in order to improve the chances of an effective structure. An equally critical design consideration for the team was the driveability of the vehicle. The intent was to shorten the familiarization curve for drivers getting in the vehicle in order to lessen the amount of training required for peak driver performance in this specific car, this is a worthwhile pursuit in the context of the simulated sales market. A primary design objective was to achieve a chassis with a mass under 226 kg including a 68 kg driver. A torsional stiffness requirement of 3000 Nm/deg was targeted as a secondary design objective. To satisfy these two conflicting design objectives, a chassis with a high specific stiffness derived from the use of advanced materials was developed.



BRAKE : AP Racing
BSCD : 96/62/1/449
COOLING : Side mounted alum. radiator
DRIVE : Drexler Diff, chain driven
ELECTRONICS : Pectel SQ6
ENGINE : Honda CRF450X
FR/RR TRACK : 1530mm
FRAME : Hybrid Style
FUEL SYSTEM : Trick Flow Bosch Type
FUEL TYPE : E85
MATERIAL : Carbon Fibrous
MPD : 8000
MPT : 6900
OLWH : 2715mm / 1400mm / 1130mm
SUSPENSION : Unequal length A-Arm, pull rod actuated, adjustable anti roll bar
TIRE : Hoosier 18x6-10 R25B
UNIQUE : Laser Deposited Titanium Uprights and Hybrid Chassis
WEIGHT : 223kg
WHEELBASE : 1530mm



51

Southern Methodist Univ Hilltop Motorsports



2016 is the inaugural year for SMU's FSAE team, and the design was set to ensure that the Lincoln FSAE contest would be a successful one. The team set the design, from scratch, wanting to ensure drivability and reliability to compete in the maximum amount of dynamic events. Careful evaluation of the rules was taken throughout the design phase to ensure a compliant, efficient car for Lincoln. Our design gives us a maximum chance of manufacturing this car in the time provided and being competitive for the 2016 competition season.

Our design goals are Drivability, Reliability, and Manufacturability. Drivability: The goal is for the vehicle to provide consistent linear progressive power, handling and braking.

Reliability: Our goal is for our vehicle to finish all dynamic events.

Manufacturability: The vehicle was designed to be easy to manufacture and repair.



BRAKE : Wilwood PS1 Calipers with Wilwood 5/8" Bore Master Cylinder
BSCD : 56 mm/45.2 mm/4 cyl/ 599 cc
COOLING : OEM Honda cooling system
DRIVE : Chain drive to rear limited slip differential
ELECTRONICS : Performance Electronics PE3 ECU
ENGINE : Bone stock CBR600F4i
FR/RR TRACK : 1219 mm FR/1168 mm RR
FRAME : MIG welded CroMolly space frame
FUEL SYSTEM : OEM Honda fuel pump with student built aluminum tank
FUEL TYPE : 93 Octane
MATERIAL : Blood Sweat and Tears
MPD : 52 KW @ 11500 RPM
MPT : 45 Nm @ 9000 RPM
OLWH : 2540 mm, 1219 mm, 1118 mm
SUSPENSION : 4 Wheel independent push rod suspension
TIRE : Hoosier 20.0 x 7.5-13 R25B
UNIQUE : Designed and built from scratch by first year team!
WEIGHT : 700 lbs
WHEELBASE : 64 in





For the 2015-2016 racing season, Saluki Racing set out to build a more competitive car by focusing on weight reduction. This was achieved by compacting the chassis and removing excess weight from components such as the differential. The chassis and wiring harness was designed and built in house at the SIU Formula team's shop. A direct acting suspension and the removal of the chassis rear box were other improvements. These along with other improvements and considerations will allow us to become a more competitive team this year.

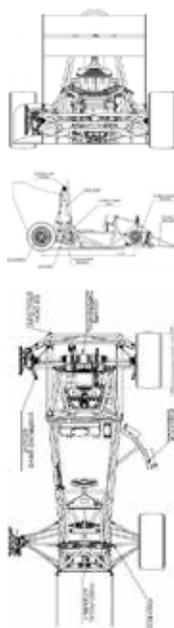
A special thanks to our team faculty advisor Dr. James Mathias as well as Dr. Rasit Koc, Dr. Lizette Chevalier, and Tim Attig for their continued support



BRAKE : Iron, Hub Mounted 228mm dia
BSCD : 67 mm / 42.5 mm / 4 cyl. / 599 cc
COOLING : Aluminum Radiator Core, Electric Fan
DRIVE : Chain
ELECTRONICS : Megasquirt MS3-Pro
ENGINE : Kawasaki ZX6R 2007
FR/RR TRACK :
FRAME : Tube Frame
FUEL SYSTEM : Fuel Injected
FUEL TYPE : 93 octane
MATERIAL :
MPD : 12,000
MPT : 10,000
OLWH : 85 in, 21 in, 40 in
SUSPENSION : Direct Acting Shocks
TIRE : 20 in Hoosier
UNIQUE : Adjustable Pedal Assembly
WEIGHT : 625 lbs
WHEELBASE : 61 in



TR-16, the next iteration of Triton Racing's formula, sports a full aerodynamics package, carbon fiber De Dion type rear suspension, topology optimized rear uprights and bellcranks, and much more. The foundation of TR-16 involves innovations of chassis, powertrain, and aerodynamic design.



BRAKE : Outboard front Wilwood calipers; Inboard rear Wilwood Caliper
BSCD : 65.5mm/44.5mm/4/600cc
COOLING : Single aluminum radiator with 2 fans
DRIVE : Chain driven Quaife differential
ELECTRONICS : Yamaha FZ6R OEM ECU with piggyback Powercommander
ENGINE : Yamaha FZ6R
FR/RR TRACK : Front: 1270mm/50in Rear: 1219mm/48in
FRAME : Welded 4130 Steel Frame
FUEL SYSTEM : EFI
FUEL TYPE : 93 Octane
MATERIAL : Large Variety
MPD : 84 hp @ 9900 RPM
MPT : 52 ftlb @ 6800 RPM
OLWH : Length: 3023mm/119in Width: 1498mm/59in Height: 1220mm/48in
SUSPENSION : Front Double Wishbone, Rear de Dion, Pushrod actuated
TIRE : Front: 20.0x7.5-13 Rear: 20.0x7.5-13 R25B
UNIQUE : 7% decrease of wheel base
WEIGHT : 680 lbs
WHEELBASE : 1651mm/65in



54

Univ of Southern California

USC Racing



USC Racing is proud to present the SCR 16. Our 2016 car marks USC Racing's 6th consecutive car to come to competition. The design philosophy behind SCR 16 was threefold: Refined Performance, Improved Testing, and Improved Reliability. To meet these goals, the team looked to make small iterative changes to improve upon past knowledge rather than attempting a total vehicle overhaul. As a result, SCR 16 is the most refined and best performing car USC Racing has ever made.

55

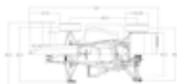
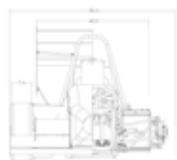
Univ of North Texas

Mean Green Racing

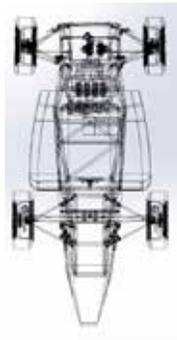


The philosophy of the 2016 Mean Green Racing team has been to design a "driver's car". If the drivers can maximize their seat time in a comfortable cockpit, then they can perform at their best. A "driver's car" requires a balance between the engineer's ideal vehicle and driver ergonomics.

This philosophy along with improved reliability and reducing overall weight has helped the team to become more successful.



BRAKE : Discs, with single piston calipers
BSCD : 67mm/ 42.5mm/ 4 cylinders/ 599.8cc
COOLING : Electric Water Pump, Double Pass Radiator
DRIVE : RWD
ELECTRONICS : Custom Steering Wheel, AEM ECU
ENGINE : Yamaha R6 2003-2005
FR/RR TRACK : 1462/ 1415 mm
FRAME : Spaceframe 4130 Steel
FUEL SYSTEM : Standard Fuel Injection
FUEL TYPE : 93 Octane Gasoline
MATERIAL : Steel, Aluminum, Carbon Fiber
MPD : 80 HP (11,000 rpm)
MPT : 35 ft-lb (8,500 rpm)
OLWH : 3048/1179/1486 (mm) 120/46.4/58.5 (Inches)
SUSPENSION : Pull Rod Actuated Front - Push Rod Actuated Rear - Unequal A-Arms FR/RR
TIRE : 13" Hoosier R-25 B
UNIQUE : Electro-Pneumatic Shifting
WEIGHT : 650 lb
WHEELBASE : 1575 mm / 62 inches



BRAKE : Brembo P34G Calipers, 4130 - Floating 4130 rotors
BSCD : 2.6 in. bore/ 1.7 in stroke/ 4 cyl/ 599 cc
COOLING : Sidepod mounted, custom aluminum radiator
DRIVE : Taylor Racing MK2 differential and half-shafts with custom tripod housings
ELECTRONICS : Performance Electronics PE3
ENGINE : Honda CBR600 F4i
FR/RR TRACK : 50" front/48" rear
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Stock fuel rail, Stock Injectors, and DeatschWerks fuel pump
FUEL TYPE : 93 Octane
MATERIAL : 4130 Steel, Carbon Fiber, and Aluminum
MPD : 10,500
MPT : 7500
OLWH : 117 in, 57.6 in, 45.6 in
SUSPENSION : SLA, Pullrod Actuated Spring/Damper, Adjustable Anti-Roll Bars (Blade-type)
TIRE : Hoosier 20.5" x 7" x 13" R25B
UNIQUE : 3D Printed Intake (Ultem 1010)
WEIGHT : 600 lbs
WHEELBASE : 63 in



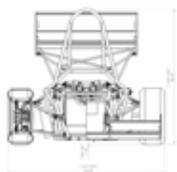
United States



United States



The 2016 University of Alberta FSAE car is a refinement of the 2015 model. Using a tried and true platform, small improvements were made to make the new model easier to manufacture, drive, and work on. An easily adjustable pedal system ensures the car is usable for a large range of drivers and a new steering wheel provides feedback on engine rpm, gear, and engine temp. Plastic body panels removes much of the expensive and difficult carbon fiber work. These changes, along with a more reliable power train will make the 2016 car a worthy contender.



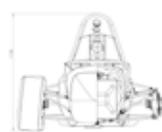
BRAKE : AP Racing CP4226, 25.4 mm bore, dual opposing, ductile cast iron rotors
BSCD : 95mm/63.4mm/1/449cc
COOLING : 2 Side mounted aluminum YZ450F radiators, no fans
DRIVE : 520 series chain with 11 and 40 tooth sprocket sizes
ELECTRONICS : ViPec engine logging
ENGINE : Yamaha WR450F
FR/RR TRACK : 1219mm/1168mm
FRAME : 4130 steel space frame
FUEL SYSTEM : EFI
FUEL TYPE : 100 Octane
MATERIAL : Steel, aluminum, carbon fiber, ABS plastic
MPD : 34.1kW @ 10500rpm
MPT : 27.5Nm @ 7000rpm
OLWH : 3090mm, 1437mm, 1229.1mm
SUSPENSION : Double unequal length A-Arm. Push rod actuated
TIRE : 20.5 x 7.0 -13" Hoosier R25B
UNIQUE : Custom datalogger, first gear of stock transmission removed
WEIGHT : 568lb
WHEELBASE : 1600mm



The University of Calgary Formula SAE team is proud to present the next vehicle in our program's legacy. Schulich Racing's ambitious nature has fostered innovations in safety, performance and reliability throughout its life. With a sized and experienced roster, the 2016 team is determined to perform within the top 20 teams this year at Lincoln.

A strong team structure was implemented to manage over sixty students involved in the project this year. Students were divided into sub teams which included Frame and Body, Powertrain, Suspension, and Electrical. Collaboration between each sub-team was the key to attaining our goals with this year's vehicle.

Schulich Racing's SR-17 has been designed with greater emphasis on data driven decisions using competition points structure analysis and lap time simulation to provide predictability in a competition setting. Key design changes include optimization of powertrain output, suspension traction characteristics, electrical harness and component reliability, and frame structure. A renewed focus on performance, efficiency, reliability, manufacturing, and testing drove the production of this year's vehicle.



BRAKE : Wilwood Calipers, Four Outboard Floating Vented Rotors
BSCD : 67.0 mm/42.5 mm/4 Cylinders/599 cc
COOLING : Rear Mounted, Aluminum Radiator w/ Fan
DRIVE : Chain Driven w/ Torsen LSD
ELECTRONICS : Hal-tech Elite 1500 ECU
ENGINE : Honda CBR600 F4i
FR/RR TRACK : 1092 mm/1100 mm
FRAME : Steel Tube Space Frame
FUEL SYSTEM : Honda/Bosch PGM-FI
FUEL TYPE : 93 RON Gasoline
MATERIAL : Steel, Aluminum, Carbon Fibre, Plastics
MPD : 10000
MPT : 9000
OLWH : 2720 mm/1450 mm/1230 mm
SUSPENSION : Double Unequal Length Wishbone, Pullrod Actuated Outboard Dampers, Anti-roll
TIRE : Hoosier R25B 20.5x1-13
UNIQUE : Carbon fibre composite use on multiple components
WEIGHT : 590 lbs
WHEELBASE : 1596 mm

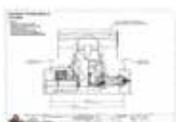




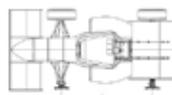
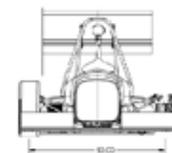
The 2016 vehicle is a revolution to the LOBO motorsports legacy, while still retaining the core values that shape our cars: two-pedal drivability, an efficient and aesthetically-pleasing aerodynamics package, and a robust powertrain. This year's vehicle has been improved with a new engine and the introduction of novel active systems.



California State University, Fullerton will be headed to Lincoln, Ne, with many new upgrades. This year, the team's goal was to regain its momentum and apply solutions to the mistakes that were exposed during the manufacturing processes and testing seen from previous years. In order to further the evolution of Titan Formula Racing, it was decided that an aero-package would be implemented.



BRAKE : four disk and caliper
BSCD : 95mm/63.4mm/1cyl/449.3cc
COOLING : Single core radiator
DRIVE : rwd
ELECTRONICS : modular wire harness
ENGINE : KTM 450 SX-F
FR/RR TRACK : 1372mm/1321mm
FRAME : Welded steel spaceframe
FUEL SYSTEM : Fuel injected
FUEL TYPE : E85
MATERIAL :
MPD : 53hp (11000rpm)
MPT : 44.2Nm (10500rpm)
OLWH : 3048mm,1588mm,1188mm
SUSPENSION : In plane double A-arm
TIRE : 18.0 x 6.0-10 LCO Hoosier
UNIQUE : Design derived from vehicle dynamics theory
WEIGHT : 524lb
WHEELBASE : 1575mm



BRAKE : Tilton 77 Series/Wilwood PS-1
BSCD : 65.5/44.5/599
COOLING : Ducted, Aluminum Dual Pass Radiator w/ Twin Spal 6" Fans
DRIVE : 6 Speed Sequential w/Servo Actuation, Chain Driven Drexler Diff
ELECTRONICS : PE3 ECU, Custom Harness, RaceCapturePro2 Data Logger
ENGINE : 2006 Yamaha R6S
FR/RR TRACK : 51"/51"
FRAME : Three Piece Carbon Fiber Chassis with Stressed Engine
FUEL SYSTEM : Returnstyle Fuel Injection w/Custom Fuel Rail and Pressure Regulator
FUEL TYPE : 93 Octane
MATERIAL : Carbon Fiber
MPD : 87hp @ 12,000
MPT : 45 @ 8,000-10,000
OLWH : 122"/59"/47.5"
SUSPENSION : Unequal-Unparallel A-Arms, Inboard Rocker Mounted Coilovers
TIRE : Hoosier 20.5x7.0-13 R25B
UNIQUE : Servo Shifting, MSHD Wings
WEIGHT : 620 lbs
WHEELBASE : 65"



61**Saint Louis Univ****Parks Racing**

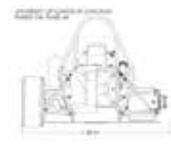
The 2016 Parks Racing team is competing in Formula SAE Lincoln for the second time in the organization's recent history. While the team has produced several different designs in the past, this year's submission will serve as a foundation for future teams to incrementally improve upon. The team focused on producing a low cost car which incorporated as many stock components from the donor motorcycle, a Honda CBR600F4i, as possible. Tooling as well as ease of maintenance were additional design priorities. This would allow the end-user, the weekend racer, to more easily source parts and perform a repair if there are any off-track excursions. The basic car is designed to be reminiscent of old Indy and Formula vehicles from eras before the over utilization of aerodynamic aids. Extensive use of aerodynamic aids for traction and cornering sometimes create more difficulties than they are worth, especially for the non-aerodynamicist: the weekend racer.



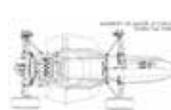
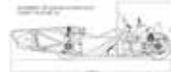
BRAKE : Wilwood calipers, Tilton master cylinders
BSCD : 67 mm/42.5 mm/4/599 cc
COOLING : Centrally mounted stock radiator
DRIVE : Chain, torsen type differential
ELECTRONICS : Modified stock harness with safety circuitry
ENGINE : Honda CBR600F4i
FR/RR TRACK : 54 in/54 in
FRAME : 4130 Space Frame
FUEL SYSTEM : Custom aluminum tank, stock EFI
FUEL TYPE : 93 Octane
MATERIAL : Carbon fiber nosecone and sidepods
MPD : 12,500 rpm
MPT : 10,500 rpm
OLWH : 133 in/54 in/45 in
SUSPENSION : Unequal streamline A-arms, direct acting
TIRE : 13" R35A
UNIQUE : Modular transaxle
WEIGHT : 700 lb
WHEELBASE : 80 in

**66****Univ of Illinois - Chicago****UIC Motorsports**

We focused on refining all systems, and putting extra time into ECU Development for future years.



BRAKE : 4130 Floating Rotor, Tilton 76 Masters, PS1 Calpiers
BSCD : 67.0 mm, 42.5 mm 4cyl, 599cc
COOLING : 9x9x2 Single Pass Radiator with Fan
DRIVE : 520 Chain, Drexler 45/60
ELECTRONICS : EL 129
ENGINE : Honda CBR600 F4i
FR/RR TRACK : 1184 mm / 1156 mm
FRAME : 4130 Space Frame
FUEL SYSTEM : Multi point Port injection
FUEL TYPE : 93 Octane
MATERIAL : Carbon, Billet, Aluminum, Bro
MPD : 10,500
MPT : 7000
OLWH : 2,801 mm, 1380 mm 1007 mm
SUSPENSION : SLA Push Rod
TIRE : 18.0 x 6.0-10 LCO Hoosier
UNIQUE : Pneumatic Shifting and clutch
WEIGHT : 600 lb
WHEELBASE : 1570 mm





UND FSAE 2016 has evolved the UND FSAE 2015 design into a better handling, more reliable, and lighter design. Our hope is that our revised suspension, new steering design, and more robust cooling system will lead us to top the UND FSAE team-best finish from 2015.

UND FSAE 2016 has also aimed to create a culture of success within the team by increasing the membership of students of all class levels as well as revising our management structure. Our goal is that this work will advance the technical capability and learning experience of future UND FSAE teams.

We would like to thank our friends, families and sponsors for their generous support of the UND FSAE team.



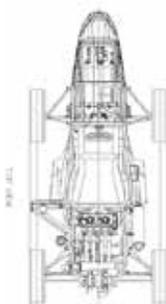
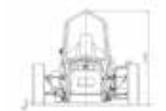
BRAKE : Wilwood PS-1 Calipers, Hub Mounted Rotors
BSCD : 67.0 mm, 42.5 mm, 4, 599 cc
COOLING : Rear Mounted, Single Core, Double Pass Aluminum Radiator
DRIVE : Chain-drive, Quaife Differential
ELECTRONICS : Haltech PS1000 ECU
ENGINE : Honda CBR 600 F4i
FR/RR TRACK : 1143 mm. 1143 mm
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Haltech PS1000, sequential fuel injection
FUEL TYPE : 93 Octane
MATERIAL : 4130 Steel, Carbon Fiber, 6061 Al, 7075 Al
MPD : 8500
MPT : 8500
OLWH : 2604 mm, 1320 mm, 1255 mm
SUSPENSION : Double unequal length A-Arm. Push rod actuated spring/damper.
TIRE : Hoosier 20.5 x 7.0-13, R25B
UNIQUE : Rapid prototyped intake
WEIGHT : 650 lb w/ Driver
WHEELBASE : 1550 mm



We participate from Japan.

We make a new car from a new concept with new team members every year. Our concept keyword is "People and vehicles sense of unity".

This car stimulate the fun to drive by "Driving position, Operability, Response of the vehicle" to driver. We aim to Autocross 10th within and Total 15th within.



BRAKE : Fr:2 outboard Rr:1 inboard
BSCD : 67mm Bore , 42.5mm Stroke , 4 Cylinders , 599cc
COOLING : Single , side mounted radiator
DRIVE : Chain drive
ELECTRONICS : motec
ENGINE : HONDA CBR600RR PC37E
FR/RR TRACK : 1200mm/1200mm
FRAME : Tubular space frame
FUEL SYSTEM : Fuel injection
FUEL TYPE : RON100 Gasoline
MATERIAL : Steel
MPD : 50kW/9000 rpm
MPT : 60Nm/7500 rpm
OLWH : 2850mm,1352mm,1165mm
SUSPENSION : Double unequal length A arm
TIRE : 20.5x6.5-13
UNIQUE :
WEIGHT : 250kg
WHEELBASE : 1600mm



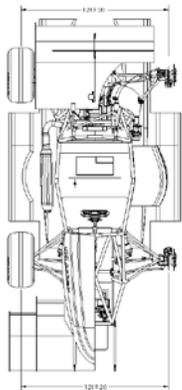
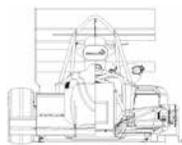
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Univ of Akron Zips Racing



The Zips Racing team has produced its 25th vehicle since 1990, the ZR16. The design of the ZR16 revolves around our main philosophy of developing a vehicle that is simple in nature yet lightweight and reliable. Using a very tight weave between design integration and advanced manufacturing processes we have produced a vehicle far more superior to any of the past.

We would like to thank all of our sponsors and supporters for their contributions that have helped develop the ZR16.



BRAKE : Gray cast iron floating discs, ISR brake calipers
BSCD : 95mm/63.4mm/single/449cc
COOLING : Single side mounted radiator with controlled fan
DRIVE : Chain-drive, Drexler Formula Student Differential
ELECTRONICS : Motec M150, ACL, VIM, PDM
ENGINE : Yamaha WR450F
FR/RR TRACK : 1219mm/1219mm
FRAME : Tubular space frame with bonded composite honeycomb panels
FUEL SYSTEM : Student designed sequential fuel injection
FUEL TYPE : E85
MATERIAL : 4130, CFRP, Ti, Al, Plastics
MPD : 52.57kW (10500rpm)
MPT : 51.52kW (7500rpm)
OLWH : 2918mm, 1422mm, 1105mm
SUSPENSION : Double unequal length A-arms, pullrod actuated coilovers
TIRE : Hoosier 6.0/18.0-10 LCO
UNIQUE : Electronic throttle, unsprung aerodynamics
WEIGHT : 227kg
WHEELBASE : 1529mm



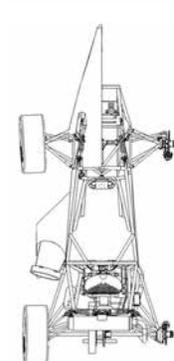
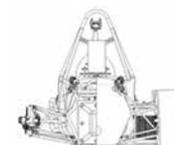
74

Univ of Arizona Wildcat Formula Racing



Wildcat Formula Racing had simple goals for the WF16: make it simple, make it awesome. The University of Arizona 2016 design team focused on major iconic features for the newest car, highlighting possibly too much weight in the front on a mid-engine car, an outdated forward roll hoop brace design, a really old engine, minor tolerancing setbacks, white wall tires, and an exhaust system focusing too much time on physical appearances. The goals were established early in the design phase, carried over and refined from previous design concepts. Strong team dynamics were required to put the design into reality. A heavy emphasis was placed on manufacturability to maximize testing time prior to competition, resulting in an expectedly delayed time-line anyways from financial complications.

For many years, Wildcat Formula Racing has been advancing International engineering practices with the classic adage of "work hard, play hard." This year the team has taken that philosophy close to heart, working hard and playing very hard. The WF16 embodies the absolute pinnacle of motorsport technology from the University of Arizona, leaving a powerful, inspirational legacy for future teams to follow.



BRAKE : Tilton 77 Master Cylinders, Brembo Calipers
BSCD : 67.0 mm/42.5 mm/4/599 ccm
COOLING : Water Cooled Radiator
DRIVE : Chain
ELECTRONICS : PE3
ENGINE : 2003 GSX-R 600
FR/RR TRACK : 50/48 mm
FRAME : 1026 DOM Steel Space Frame
FUEL SYSTEM : Walbro Fuel Pump
FUEL TYPE : E85
MATERIAL : Steel, Aluminum, Carbon Fiber
MPD : 9000 rpm
MPT : 7500 rpm
OLWH : 3077 mm/ 1474 mm/ 1221 mm
SUSPENSION : Push Rod Actuated, Unequal Length A-Arm
TIRE : Hoosier R25B 20.0 x 7.5-13
UNIQUE : White Walls
WEIGHT : 620 lbs
WHEELBASE : 1727 mm/68 inches



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Univ of Texas - San Antonio Roadrunner Racing



For the 2016 competition year, Formula SAE at The University of Texas at San Antonio designed an entirely new chassis and suspension system following a new design philosophy of minimalism that suits the strengths of the team as a whole. Emphasis was placed on low cost, simplicity, and reliability.



BRAKE : Front: outboard, Rear: inboard
BSCD : 96/62.1/1/449
COOLING : Water cooled, mechanical pump
DRIVE : Rear wheel chain drive with limited slip differential
ELECTRONICS : AEM Infinity 6 EMS
ENGINE : KFX450R
FR/RR TRACK : (1270/50), (1270/50)
FRAME : Mild steel space frame
FUEL SYSTEM : Electronic fuel injection
FUEL TYPE : 93 octane
MATERIAL : Steel
MPD : 40 hp (7750)
MPT : 28 ft-lbs (4350)
OLWH : (2464/97), (1473/58), (1295/51)
SUSPENSION : Drag setup
TIRE : 18X6-10 Hoosier LCO
UNIQUE : Reverse gear
WEIGHT : 525
WHEELBASE : 1575/62



United States

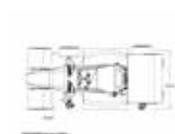
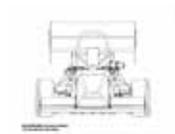
77

Iowa State Univ Cyclone Racing



CR-21 is Iowa State University's 21st car to compete in the Formula SAE series. For CR-21, emphasis was placed on the continued improvement of all systems from the previous generations. Reducing the number and complexity of components to decrease manufacturing time, improved reliability, and refinement of the engine system was also strongly emphasized. To increase manufacturing simplicity, all 2D parts were water jet or laser cut. This year's car continues on 10" wheels and features unique a-arms that are machined from aluminum plates. The powertrain remains largely the same as last year as we continue to use the Yamaha YFZ450R engine. Our intake/restrictor is 3D printed in Stratasys's proprietary high strength material, ULTEM

1010. The pedal mounts have 5" of adjustability to accommodate a range of driver heights. The use of aircraft fabric bodywork eliminated the need for composites molds and saved time, money and weight.



BRAKE : Wilwood PS-1 Calipers, Tilton 77 Series Master Cylinders
BSCD : 95 mm/63.4 mm/1/449 cc
COOLING : Polaris WideTrak 600 Radiator, SPAL Fan
DRIVE : Torsen Type T1 Differential in Student Built Aluminum Housing
ELECTRONICS : Performance Electornics PE3 ECU, AiM MXL Data Logger
ENGINE : 2014 Yamaha YFZ450R, 14:1 Wiseco Piston
FR/RR TRACK : 1219 mm/48 inch, Rear: 1270 mm/50 inch
FRAME : TIG Welded 1020 Steel Spaceframe, Black Textured Powder Coat
FUEL SYSTEM : Single Bosch EV14 Injector, Aeromotive FPR, Welded Aluminum Tank
FUEL TYPE : Car: E85
MATERIAL : Valyrian Steel, Kyber Crystals,
MPD : 42 HP at 9000 RPM (31.3 kW)
MPT : 28 ft-lb at 7750 RPM (38 Nm)
OLWH : Length: 2781 mm/109.5 inch Width: 1435 mm/56.5 inch Height: 1067 mm/42 in
SUSPENSION : Pushrod Actuated Ohlins TTX25 MKII Dampers, NonParallel Unequal Length A-Arm
TIRE : 6.0/18.0-10 Hoosier LCO
UNIQUE : Machined Aluminum A-Arms, Trademarked University Logo
WEIGHT : 524 lb/238 kg
WHEELBASE : 1575 mm/62 inch

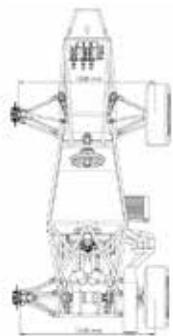


United States



UP Racing is the first year FSAE team of Universidad Panamericana Campus Guadalajara, Mexico.

The number one goal was to build a simple, but reliable car that was capable of finishing all the dynamic events to set a good foundation for the next years, so we could improve gradually in every system.

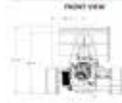


BRAKE : Wilwood GP200 Calipers
BSCD : 65/45.2/4/598
COOLING : Single side mounted radiator
DRIVE : Chain Drive. Taylor Differential
ELECTRONICS : Student Made
ENGINE : Honda CBR600F2
FR/RR TRACK : 1200/1170 mm
FRAME : Steel spaceframe
FUEL SYSTEM : Custom Fuel Tank. Carburetor
FUEL TYPE : 93 Octane
MATERIAL : 4130 Chromoly Steel
MPD : 10000
MPT : 8000
OLWH : 2700,1400,1135 mm
SUSPENSION : Double unequal length A-Arms. Pushrod actuated dampers
TIRE : 20.5X7-13. R25B Hoosier
UNIQUE :
WEIGHT : 330 kg
WHEELBASE : 1550 mm

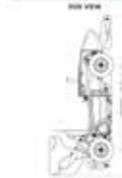


The team from ETS has always had one goal, victory. Every car that comes out of our facilities reflects our mentality. We pay special attention to design and details to ensure that the car reaches its peak performance. For those reasons, the Formula team from ETS is perceived as one of the leaders in their field, which allows them to promote Engineering excellence from Quebec around the world.

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BRAKE : Outboard
BSCD : 450cc
COOLING : Water
DRIVE : Mini Chain
ELECTRONICS :
ENGINE :
FR/RR TRACK : FR:45in RR: 43in
FRAME :
FUEL SYSTEM :
FUEL TYPE : E85
MATERIAL : Steel, aluminium, carbon,
MPD : 8500
MPT : 6000
OLWH : 127in X 45in X 47in
SUSPENSION :
TIRE : 10in Hoosier
UNIQUE : Team
WEIGHT : 460lbs
WHEELBASE : 62.25in





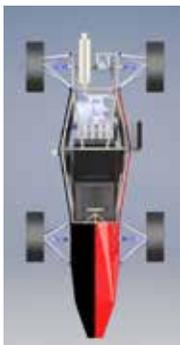
For the 2016 UNB Fredericton Firecats Formula SAE car, the primary design goal was to keep the car and its sub systems as simple as possible while still remaining competitive. Because it is the first SAE project at UNB, reliability and ease of manufacturing were emphasized.

The chassis was designed with driver ergonomics in mind. The frame features copious leg room and is spacious enough to allow for large drivers. With a fixed seat and adjustable pedal assembly, varying driver heights with minimal change in center of gravity was achieved.

The team elected to use a Honda F4i 600CC engine, incorporating a turbo and forced air intake. The engine also utilizes a stock ECU, "Accusump" oil accumulator, and custom headers to maximize efficiency. The fuel system uses a double filtration configuration to protect the injectors.

The design focus for the suspension system was adjustability, driver feedback, and overall geometry. Secondary goals include minimizing unsprung mass, and ease of repair.

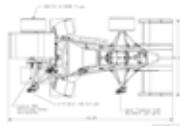
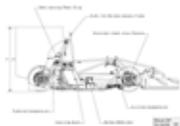
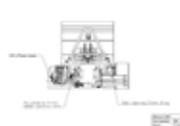
The pedal box was designed to contain the throttle and brake pedal. The clutch meanwhile, in on the shifter as a hand clutch, conforming to driver preference.



BRAKE : Bias bar assembly with dual master cylinders, front and rear Wilwood calipers
BSCD : 67 Bore, 42.5 stroke, 4 cylinder, 600cc
COOLING : OEM Honda radiator and expansion tank, mounted on the side of the chassis
DRIVE : Chain driven torque biasing differential
ELECTRONICS : Stock ECU and a handmade wiring harness
ENGINE : Honda CBR F4i 600cc
FR/RR TRACK : FR: 1250mm, RR: 1150mm
FRAME : Typical space frame design
FUEL SYSTEM : Fuel tank with internal baffles, one-way gate, and double filtered pump
FUEL TYPE : 93 Octane
MATERIAL : AISI 4130 chromoly
MPD : 10000
MPT : 9000
OLWH : length: 2855mm, Width: 1427mm, Height: 1397mm
SUSPENSION : Double A-arm: Kaz-Tech 1/4 Midget, pushrod actuation
TIRE : 20.5 x 7-13 R25B Hoosier
UNIQUE : Spacious frame, with fine tuned driver ergonomics
WEIGHT : 376 Kg
WHEELBASE : 1828mm



Missouri S&T's 2016 Formula SAE car relies on a high down force, high horsepower platform. The vehicle is powered by a 4 cylinder Kawasaki ZX-6R engine, and utilizes an un-equal length double A-arm suspension and semi-unsprung aerodynamics package to ensure optimum tire contact. The car first drove on Feb. 19 and has undergone an extensive testing and tuning season. S&T Racing would like to thank our family, friends, and sponsors for supporting us throughout the year. Thank you.



BRAKE : Front ISR 4 Piston Monobloc, Rear 2 Piston Monobloc
BSCD : 67mm/42.5mm/4/600cc
COOLING : Two Single Pass Radiators
DRIVE : Chain Drive
ELECTRONICS : Battery 6Ah A123 LiFePO4 Cells, Aim Evo 4, MoTec M600
ENGINE : 2012 Kawasaki ZX-6R
FR/RR TRACK : 1219mm/1194mm
FRAME : Tubular Space Frame
FUEL SYSTEM : Custom
FUEL TYPE : 100 Octane
MATERIAL : 4130 Steel
MPD : 12000
MPT : 9500
OLWH : 3031mm/1448mm/1193mm
SUSPENSION : Un-Equal Length Double A-arm
TIRE : 18x7.5-10 Hoosier R25B
UNIQUE : Semi-Unsprung Aerodynamics Package
WEIGHT : 588lb
WHEELBASE : 1625mm



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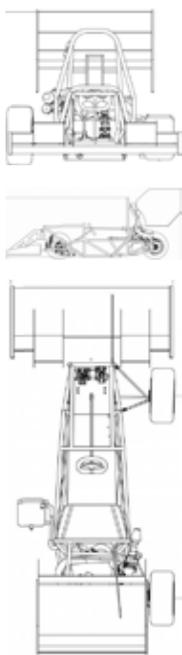
Kettering Univ

kettering university motorsports



University Motorsports looks to improve upon our design this year. GMI 2016 is the second turbocharged car from Kettering FSAE. Through development and improved designs we are confident in another successful season.

We would like to thank all of our sponsors for their support in the pursuit of the spirit of SAE.



BRAKE : 1018 Steel Rotor, Tilton MC, Wilwood Calipers
BSCD : 95mm / 62.4mm / 1 cyl / 450cc
COOLING : Side mounted radiator
DRIVE : Chain driven ATB differential
ELECTRONICS : Custom PCB fuse box, Woodward 70 pin ECU
ENGINE : Yamaha WR450F
FR/RR TRACK : 1183 mm, 1183 mm
FRAME : 1018 Mild Steel
FUEL SYSTEM : Dual stage EFI
FUEL TYPE : E85
MATERIAL : Steel, Aluminum, Carbon
MPD : 65 hp, 11200 rpm
MPT : 53 Nm, 6800 rpm
OLWH : 3060 mm, 1320.8 mm, 1193 mm
SUSPENSION : Double unequal length A-Arm with Pull Rod Front and Push Rod Rear
TIRE : 18x6.0 - 10 Hoosier LCO
UNIQUE : Turbo
WEIGHT : 525 lbm (238 kg)
WHEELBASE : 1676 mm



91

Wayne State Univ

Warrior Racing



The Wayne State University Formula SAE team is entering its 14th competition season with its 10th iteration vehicle, Road Warrior X (RWX). The design of RWX was influenced by the success of our previous vehicle, RW9, which performed better than any other in our team's history. Our goals for the vehicle included validating changes made from RW9 to RWX, decreasing the overall weight of the vehicle, and optimizing the integration of powertrain and chassis components.

We would like to thank our sponsors for their support and generosity. Their continued assistance has helped us grow our program and produce the best road warrior yet.



BRAKE : Brembo 32 mm Caliper; Front Pivoting MC's; Cast Iron Rotors
BSCD : 67 / 42.5 / 4 / 599cc
COOLING : Electric WP / Side mounted dual pass radiator / 560 cfm fan
DRIVE : 520 X-ring chain; MK@ TRE Quaife ATB
ELECTRONICS : ECM controlled switches / Relay control of fused auxiliary components
ENGINE : 2014 Honda CBR600RR
FR/RR TRACK : 1270mm/1219mm (50in/48in)
FRAME : 4130 Tubular Steel Spaceframe
FUEL SYSTEM : Keihin 12-hole injectors / port injection / fully sequential
FUEL TYPE : 100 Octane
MATERIAL : 4130 Frame, Aluminum, Carbon Fiber, Steel, Rapid Prototype Intake
MPD : 11500
MPT : 9000
OLWH : 2723/1505/1123 (107.2/59.3/44.2)
SUSPENSION : Double Wishbone SLA ; Pushrod actuated ; F
TIRE : Hoosier R25B: Front 20.5x6-13 , Rear 20x7.5-13
UNIQUE : Made in the motor city
WEIGHT : 620
WHEELBASE : 1651mm/65in



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Auburn Univ War Eagle Motorsports



Auburn Formula SAE presents AU2016, the 20th vehicle of a storied program. AU2016 features a Yamaha R6 motor, delivering the 82 highly-durable bhp and broad torque curves that the target market demands. The hybrid monocoque design allows for a light, stiff chassis that meets power/weight ratio goals while providing superior handling characteristics at the vehicle's limit. New for 2016 is a full aerodynamics package that allows AU2016 to explore the realm of high-downforce cornering and enhanced levels of grip.

None of this would be possible without our sponsors and community partners whose continued backing of our team, and ultimately our engineers, has helped us succeed in developing new technologies and training bright engineers. It would be impossible to continue our work as AUFSAE without the time, money, and resources they have given to us.

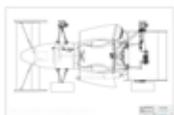
War Eagle!



BRAKE : Floating Rotor, Adjustable Bias
BSCD : 67 mm, 42.5 mm, 4 Cylinders, 599 cc
COOLING : Dual Pass Radiator
DRIVE : Chain Drive, Salisbury Differential
ELECTRONICS : MoTec M800/PDM/C185, Bosch ETC,
 Wireless Telemetry



ENGINE : Yamaha R6
FR/RR TRACK : 1219.2 mm (48 in), 1193.8 mm(47 in)
FRAME : Hybrid Monocoque
FUEL SYSTEM : In-Tank Pump, Port Injection
FUEL TYPE : 93 Octane



MATERIAL :
MPD : 82.7 hp (10,500 RPM)
MPT : 43 ft-lbf (8,000 RPM)
OLWH : 2968 mm (116.8504 in), 1422 mm (55.98 in),
 1200 mm (47.24 in)
SUSPENSION : SLA
TIRE : 10" R25B
UNIQUE : Symmetrical Sidepods!
WEIGHT : 560.5 lb
WHEELBASE : 1562.1 mm (61.5 in)



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Univ of Toledo Rocket Motorsports



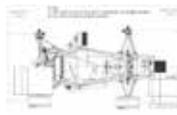
This year's car UTR-22, was built around simplicity and reliability while also taking on some new features. Utilizing tire consortium data as a starting point, UTR-22 features a rigid tubular chassis, CBR600 F4i, and Ohlins shocks backed up with extensive durability testing. Serviceability and weight reduction were also considered with every component designed. With a large amount of time dedicated to testing and refining we hope to have an all-around reliable and fine-tuned car for competition.



BRAKE : Full Floating Rotors w/ Wilwood Calipers
BSCD : 67mm/42.5mm/4/599cc
COOLING : Left side mounted, single crossflow heat
 exchanger with rear duct
DRIVE : Chain



ELECTRONICS : Haltech Platinum Sport 1000, Race
 Technology DL1, and DEWESoft Minitaur
ENGINE : Honda CBR F4i
FR/RR TRACK : 1574.8mm/1257.3mm

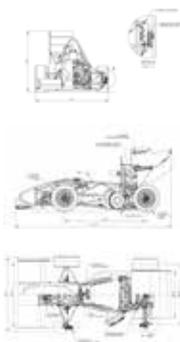


FRAME : Spaceframe
FUEL SYSTEM : Sequential Fuel Injection
FUEL TYPE : E-85
MATERIAL : 4130 Steel
MPD : 9,000
MPT : 8,000
OLWH : 2933.7mm, 1435.1mm, 1215.15mm
SUSPENSION : Non-Parallel Unequal Length Anti-Dive
 A-Arm (F)
TIRE : 7.0/16.0-10.0 Avon
UNIQUE : Variable Volume Plenum, Driver Adjustable
 Anti-roll Bar
WEIGHT : 580 lbs
WHEELBASE : 1574.8mm





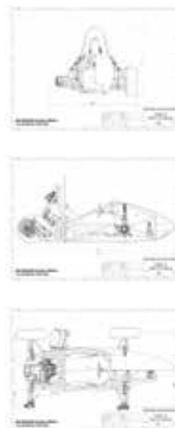
The University of Pittsburgh's PR-028 racecar was designed to be a competitive and reliable Formula SAE car in all events. To achieve this, each sub-team used various analysis methods to make decisions centered on improving performance, manufacturability, serviceability, and cost. Our design process produced a vehicle with the following main features: a steel tube chassis, 13" wheels, a Honda CBR600rr engine, a five speed transmission, paddle activated electro-pneumatic shifting, a manually actuated clutch behind the steering wheel, a complete MoTeC Electronics suite, and front and rear aerodynamics packages.



BRAKE : Slotted 4142 Floating Rotors,
BSCD : 67/42.5/4/599
COOLING : Left side mounted cross-flow dual pass radiator, 844 cfm fan
DRIVE : Chain driven, 428 chain
ELECTRONICS : MoTeC m400 ECU, PDM 32, SDL3 datalogging
ENGINE : Honda CBR600RR
FR/RR TRACK : 1280mm/50.3in F, 1177mm/46.3in R
FRAME : Steel tube space frame
FUEL SYSTEM : Stock Honda CBR600rr, Sequential-Fire, Port Electronic Fuel Injection
FUEL TYPE : 93
MATERIAL : 4130, CFRP, Al, Ti, Plastics
MPD : 10500
MPT : 8500
OLWH : 2982mm/117.4in, 1458mm/57.1in, 1195mm/47in
SUSPENSION : Fully independent SLA, pull (F) push (R)-rod actuated coil over dampers
TIRE : 20.5X7.0, R25B, Hoosier F/20X7.5,R25B, Hoosier R
UNIQUE : 4130 cast "supernode"
WEIGHT : 620lb/281kg
WHEELBASE : 1549.4mm/61in



Knickerbocker Motorsports is introducing an entirely new platform, KMR-16, outfitted with 10" tires to reduce moment of inertia, a CBR600RR engine for optimal power, and an electro-pneumatic shift-clutch mechanism.



BRAKE : AP Racing Front Calipers, Brembo Rear Calipers, 4 gray cast iron disk rotors
BSCD : 67 mm/42.5 mm/4 cylinders/599 cc
COOLING : Side Mounted Radiator
DRIVE : Chain Driven Quaife Differential
ELECTRONICS : Motec M84
ENGINE : Honda CBR600RR
FR/RR TRACK : 1220 mm/1168 mm
FRAME : 4130 Steel Space Frame
FUEL SYSTEM : Fully sequential E.F.I
FUEL TYPE : 93 Octane Gasoline
MATERIAL : 4130 Steel Frame and Carbon Fiber Body
MPD : 10500
MPT : 9500
OLWH : 2616 mm/1400 mm/1130 mm
SUSPENSION : Unequal length non-parallel double wishbone suspension
TIRE : Hoosier 18.0x7.5-10 R25B
UNIQUE : Made with Love
WEIGHT : 276 kg
WHEELBASE : 1550 mm



E201

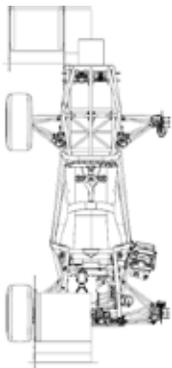
Univ of Pennsylvania

PennElectricRacing



Penn Electric Racing presents REV-TWO, our third FSAE Electric Car. Building upon the success of REV-ONE, we upgraded the aerodynamics and vehicle dynamics design theory and software. Design highlights of REV-TWO include: powertrain with 5:1 reduction, front and rear aerodynamic wings, redesigned suspension and unsprung components, and carbon fiber seat and body panels.

Thanks to all of our 2016 sponsors!



BRAKE : Single Piston Outboard Calipers with Front and Rear Master Cylinders
COOLING : Water-Cooled Motor and Motor Controller, Forced Air-Cooled Accumulator
DRIVE : Permanent Magnet Synchronous AC Motor
ELECTRONICS : Distributed, CAN-based, LPC1768 devices
EMCAC : LiCoO₂ / 5.7 kWh
FR/RR TRACK : 1156/1143 mm
FRAME : Spaceframe
MATERIAL : 4130 DOM Tubing
MAXMOTORRPM : 9999
MAXSYSVOLT : 299
MOTORCNTRLR : Unitek Bamocar D3
MOTORTYP : Enstroj Emrax 207 MV
NMLMM : 1 Rear, 80 kW
OLWH : 2895 x 1360 x 1180 mm
SUSPENSION : Unequal-length unparallel arm, pushrod actuated, U-shape antiroll bar
TIRE : Hoosier 18.0x6.0 - 10.0 LCO
TRANSRATIO : 5:1
WEIGHT : 243 kg
WHEELBASE : 1530 mm

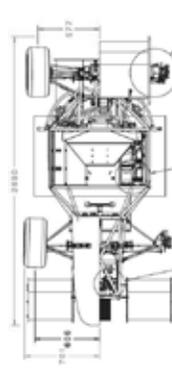
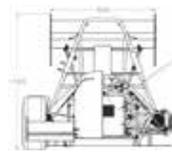
**E203**

Polytechnique Montréal

Poly eRacing



Poly eRacing is an all-electric formula SAE team which started from nothing in 2009. Our first prototype, unveiled at the summer of 2012, never competed in a dynamic event. The 2016 prototype is the result of incremental upgrades from the 2015 concept. The team focused on reducing weight, simplifying mechanical systems and gaining experience in manufacturing.



BRAKE : Floating rotors, adjustable bias
COOLING : Motor : Cells : Air
DRIVE :
ELECTRONICS : Self developed low voltage electronics
EMCAC : NCM vs graphite / 5.3 kWh
FR/RR TRACK : 1200/1100 mm / 47/43 in
FRAME : Spaceframe 4130 Chromoly
MATERIAL : Unobtanium
MAXMOTORRPM : 5000 rpm
MAXSYSVOLT :
MOTORCNTRLR : Unitek BAMOCAR D3
MOTORTYP : Enstroj EMRAX 228
NMLMM : Single 80 kW rear motor
OLWH : 2930, 1420, 1110 mm / 115, 56, 44 in
SUSPENSION : Double a-arms/push-rod with adjustable anti-roll bars
TIRE : Hoosier 18.0 x 6.0 RB25
TRANSRATIO : 3 :1
WEIGHT : 590 lbs
WHEELBASE : 1600 mm / 63 in



E206

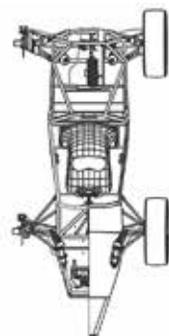
Carleton Univ Ravens Racing Electric



Carleton University's Ravens Racing has designed and produced a high-performance race car making it an ideal weekend race vehicle targeting the amateur autocross enthusiast.

Design highlights for the 2016 vehicle include: lithium iron phosphate battery back for performance, light weight, and safety; three phase AC synchronous motor with a high power-to-weight ratio; steel space frame chassis with carbon fibre panels for a high rigidity-to-weight ratio; and in-house manufactured custom aluminum wheel centers.

Carleton's design goals emphasize a balance between performance and cost-effective manufacturing. To achieve the design goals, a closed loop design process is used to create an environment of continuous improvement. Design criteria are based on the lessons learned in testing and past competitions. A wheels-in design approach is supported by Creo Parametric solid modelling, Creo Simulate FEA, and Creo Mechanism dynamic simulation. Vehicle testing is used to verify criteria compliance and provide feedback for future design work, thus completing the design cycle.



BRAKE : Cast iron floating rotor / AP master cylinders / Wilwood calipers

COOLING : Air and liquid cooled

DRIVE : Chain drive, custom Honda differential

ELECTRONICS : Custom

EMCAC : LiFePO4 / 5.5kWh

FR/RR TRACK : 1270mm / 1245mm

FRAME : Steel space frame

MATERIAL : 1020 Steel

MAXMOTORRPM : 3000rpm

MAXSYSVOLT : 300V

MOTORCNTRLR : Unitek Bamocar D3

MOTORTYP : Enstroj Emrax 228

NMLMM : Single motor, rear mounted, 75kW

OLWH : 2705mm / 1476mm / 1349mm

SUSPENSION : Double A-Arm, pushrod actuated spring and damper, u-bar ARB

TIRE : Hoosier 20.5x7.0-13 R25B

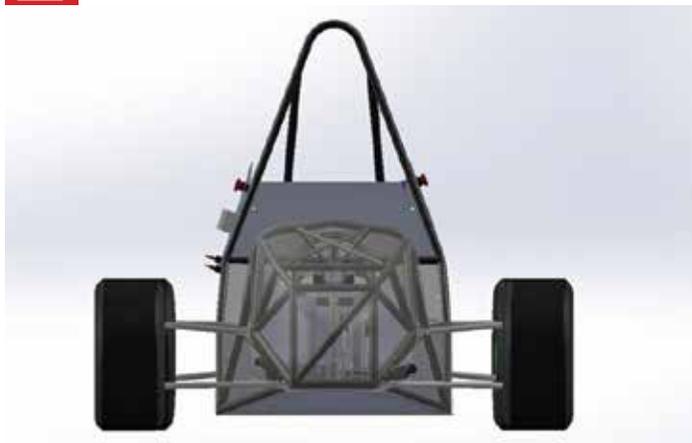
TRANSRATIO : 1 :3

WEIGHT : 300kg

WHEELBASE : 1550mm

E207

Univ of Michigan - Dearborn UMD Electric Racing



We are running with a steel frame and fiberglass body. Using SLA suspension geometry with pull rod in the front and push rod in the rear. Our battery box is about 300V peak. We are using lithium polymer batteries. The motors that we chose to use are 2 Enstroj emrax motors that will power our rear wheels. Our motor controllers are from Rinehart Motion Systems (RMS). Each motor controller powers one motor.



BRAKE : Floating disks with 4 piston calipers in front and rear

COOLING : Water cooled motor and motor controllers, air cooled batteries

DRIVE : Rear wheel drive

ELECTRONICS : AiM EVO4, Elithion BMS, electronic torque vectoring

EMCAC : Lithium Cobalt Oxide/ 5.7kWh

FR/RR TRACK : 1194 mm/ 1143 mm

FRAME : Tubular space frame with alum.

MATERIAL : 4130

MAXMOTORRPM : 3000 RPM

MAXSYSVOLT : 298 V

MOTORCNTRLR : RMS PM100DX

MOTORTYP : Enstroj Emrax, Emrax 228

NMLMM : 2 motors, rear subframe, 266 Nm

OLWH : 2622mm, 1416mm, 1192mm

SUSPENSION : SLA pull rod in front, SLA push rod in rear

TIRE : 18" x 6.0" - 10 LCO

TRANSRATIO : 2 :01

WEIGHT : 700 lbs with 150lb driver

WHEELBASE : 1150mm



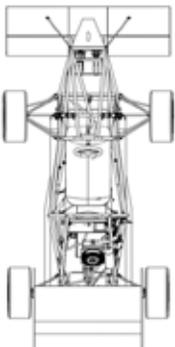
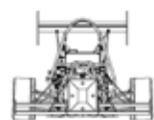
E208

Carnegie Mellon Univ

Carnegie Mellon Racing



For the 2016 season, Carnegie Mellon Racing (CMR) identified a set of vehicle-level design requirements critical to our success as a team. In mechanical design, our team focused on improving driver comfort, improving handling and decreasing turning radius, creating as many components in-house as possible, and implementing our team's first aerodynamic wings. In electrical design, our main objectives were to improve the robustness of our GLV system, increase accumulator capacity to ensure sufficient energy for endurance, and improve packaging of components and cooling in the accumulator and in our high voltage distribution system. All of the improvements are collectively targeted at improving ease of manufacturing and assembly as well as reliability and vehicle performance.



BRAKE : AP Racing/Wilwood (front/rear) 2-piston calipers, floating cast iron rotor
COOLING : Water cooled motors and intervers, air cooled accumulator
DRIVE : Rear wheel independent direct-drive, software differential
ELECTRONICS : Distributed CAN network with custom sensing & control nodes
EMCAC : LiNiCoAlO₂ (NCA), 6.5 kWhr
FR/RR TRACK : 1323/1244 mm (52/49 in)
FRAME : Tubular space frame
MATERIAL : 4130 steel
MAXMOTORRPM : 5000 RPM
MAXSYSVOLT : 299.52 V
MOTORCNTRLR : RMS PM100DX
MOTORTYP : Emrax 228 Med Voltage, Permanent Magnet AC
NMLMM :
OLWH : 2753 mm (108 in)
SUSPENSION : Double A-arm, pushrod, anti-roll bars
TIRE : 18 x 6-10 R25B Hoosier
TRANSRATIO : 1 : 1
WEIGHT : 675 lb w/ driver
WHEELBASE : 1600 mm (63 in)

**E209**

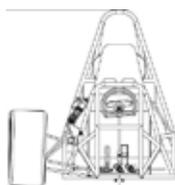
Univ of Calif - Davis

Formula Racing at UC Davis



UC Davis Formula Racing's third electric car is designed as a capable and flexible platform for powertrain innovation and technological advancement.

A major goal for this year's vehicle, FE3, was to start a process of incremental improvements from the previous year's design. By focusing on system optimization rather than a clean slate design, many subsystems have been reworked for increased modularity and manufacturability. System-wide weight reduction and simplicity were focused on throughout the design process, and all components were extensively simulated, analyzed, and validated. Other critical design elements include power efficiency, drivability, and reliability.



BRAKE : 290mm Rotors, Nissins Colette Caliper
COOLING : Passive Air
DRIVE : RWD, Single Ratio, Chain Reduction Drive
ELECTRONICS : Custom BMS
EMCAC : NMC-cathode Li-Ion / 7.5 kWh
FR/RR TRACK : 1225mm / 1225mm
FRAME : Tubular Space Frame
MATERIAL : AISI 1010 CR, AISI 1020 DOM
MAXMOTORRPM : 4800rpm
MAXSYSVOLT : 116 V
MOTORCNTRLR : Curtis 1239e
MOTORTYP : ZERO Z-Force 75-7 Permanent Magnet Synchronous
NMLMM : 1 / Mid /50 kW
OLWH : 2550mm / 1450mm / 1154mm
SUSPENSION : Double Wishbone, Pushrod Actuated, ARB
TIRE : 20.5x7-13 R25B Hoosier
TRANSRATIO : 3.92
WEIGHT : 650lb (with driver)
WHEELBASE : 1550mm



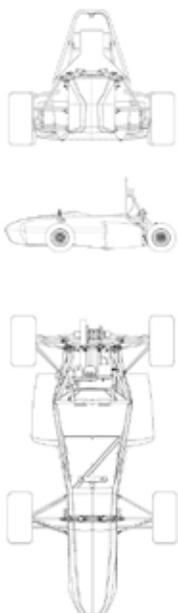
E210

Purdue Univ - W Lafayette

Purdue Electric Racing



Founded in 2013, Purdue Electric Racing has continued to focus its efforts on developing a reliable electric race car. Our work throughout 2014-2015 provided the team with valuable experiences in design, manufacturing, and overall team structure. Our team has applied the lessons learned, and we have built a much improved vehicle for 2016. Beyond this, we will continue to build a strong foundation for future development.



BRAKE : Willwood GP-200/PS1
COOLING : Water Cooling
DRIVE : Chain Drive
ELECTRONICS : Freescale KEA128 w/ Custom PCBs
EMCAC : 7.5 kWh
FR/RR TRACK : 1270 mm
FRAME : Steel Spaceframe
MATERIAL : 4130 Chromoly Tubing
MAXMOTORRPM : 6000 RPM
MAXSYSVOLT : 300V
MOTORCNTRLR : Unitek Bamocar
MOTORTYP : PMAC
NMLMM :
OLWH :
SUSPENSION : Double Wishbone, Pushrod System
TIRE : 6.0/18.0-10, LCO Hoosier
TRANSRATIO :
WEIGHT : 260 kg
WHEELBASE : 1575 mm

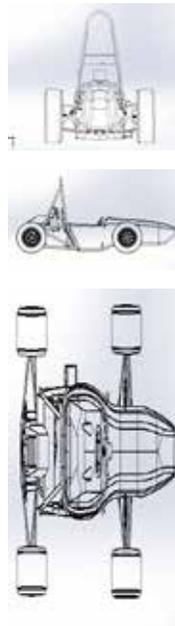
**E212**

California Polytechnic State Univ-SLO

Cal Poly Racing



The changes made to our 2016 car were motivated by testing and driver feedback in 2015. Based on the reliability of the 2015 car in testing, the team would have been able to finish the endurance event and achieved second or first place in Lincoln. With reliability as our primary goal, targeted changes were made in the interest of increased performance as determined by our student developed MATLAB lap simulator. The 2016 car incorporates a three-phase AC induction motor and hybrid monocoque chassis. Wheelbase, weight distribution, and cg height were chosen from trends that balanced theoretical minimums and rules requirements. The team chose to move from a full carbon cut-and-fold monocoque to a hybrid chassis to allow for easier access to critical components, better airflow, and better mounting options. We selected the motor and motor controller based on power-to-weight ratios and cooling requirements. A ground-up redesign of the suspension and upright assembly was undertaken as well as a reduction in battery pack size to shave 65 pounds from last year's car.



BRAKE : Brembo Caliper / Tilton Master Cylinder / Custom Rotors and Lines
COOLING : Air/Water Combined Cooling
DRIVE : Single Motor / Rear chain-drive
ELECTRONICS : Custom Dashboard and Daughter Card
EMCAC : LiPo, 3.1 kWh
FR/RR TRACK : 1194 / 1168 (mm)
FRAME : Carbon Tub / Steel Tube Subframe
MATERIAL : Carbon / 4130
MAXMOTORRPM : 5000
MAXSYSVOLT : 300
MOTORCNTRLR : Rinehart Motion Systems PM100DX
MOTORTYP : 3-phase Brushless AC
NMLMM : 1 motor / rear inboard / 80kW
OLWH : L :2908 W :1372 H :1295 (mm)
SUSPENSION : Double Unequal A-Arm, Pushrod and Pullrod Actuated Spring and Damper
TIRE : Hoosier R25B, 13-inch
TRANSRATIO : 4.2 :1
WEIGHT : 450 lbs
WHEELBASE : 66 inches



E213

San Jose State University

Spartan Racing Electric



Spartan Racing Electric is proud to introduce SRE-2, our second design cycle for the Formula SAE Electric competition. This year we settled on an architecture very early in order to mitigate the inherent challenges of building an electric car, and as a result, key components were chosen early on in the design cycle. SRE-2 features an Enstroj Emrax 228 permanent magnet motor with a Rinehart motor controller in a steel-tube chassis, powered by cylindrical Li-Ion cells. The architecture of the car varies from that of a conventional fsae car, and as a result can fully utilize the architectural freedom unique to an EV powertrain. The vehicle features a centralized controller for all vehicle functions and driver interfaces.

Thank you to our sponsors:

Celestica, Hilltop, Goengineer, Haw Ridge Systems, TTTech, Fibox, Lockheed Martin, Parker, SKF, Solidworks, Advantage Electric Supply, Keysight Technologies, CMX Systems, Bay Area Circuits, Electromatic, Mass Precision, Applied Industrial Technologies, EAO, Pegasus, BEI Sensors, EFI, Southco, Bisco Industries, Advanced Grinding, Altium, and Amphenol.



BRAKE : Dual-piston calipers, slotted floating rotors
COOLING : Water-cooled MCM/Motor, air-cooled accum.
DRIVE : Chain-driven clutch-type LSD
ELECTRONICS : Team developed vehicle control software with CANbus comm and data logging
EMCAC : LiNiCoAlO2, 179.2 millitherms
FR/RR TRACK : 48.0 in / 47.0 in
FRAME : Tubular space frame
MATERIAL : 4130 alloy steel
MAXMOTORRPM : 5500 RPM
MAXSYSVOLT : 300 V
MOTORCNTRLR : Rinehart PM100DX
MOTORTYP : EMRAX 228
NMLMM : 1 motor, mounted inboard behind driver, 80 kw
OLWH : 101.6, 56.0, 44.4 (in)
SUSPENSION : Indep. SLA, pushrod-actuated dampers
TIRE : 18.0 x 6.0 - 10 Hoosier R25B
TRANSRATIO : 3.16
WEIGHT : 509 lbm (w/o driver)
WHEELBASE : 60.5 in

**E214**

Univ of Calif - Irvine

Anteater Racing



The 2015-2016 UCI Anteater Racing Electric FSAE car is going to Lincoln Nebraska with the primary goal of passing electrical technical inspection and the secondary goal of completing the endurance course. The 2015-2016 car is an evolution of the 2014-2015 car which regrettably did not make it to competition, but did teach the current team a lot about making an electric car. The car is longer with a wider track (70" wheelbase and 50" track), but the chassis is 10" narrower than last year's car and it is 8" shorter than the previous car as well. Performance goals were a top speed of 55mph, 0-55mph in 4 seconds, 700lb weight with a 150 lb driver, 45/55 weight distribution and >22km range at nominal voltage. The 2016 car features a side pod battery design, an aluminum body, and a robust controls system with crimped and mechanically fastened connectors and printed circuit board components.



BRAKE : Wilwood PS1 outboard front, inboard rear
COOLING : Aircooled
DRIVE : dual motors, Chain drive
ELECTRONICS : Arduino Uno ECU
EMCAC : LiFeMnPO4, 7.6kWh
FR/RR TRACK : 50/49 in
FRAME : Tubular Space Frame
MATERIAL : 1020 DOM Steel
MAXMOTORRPM : 3500
MAXSYSVOLT : 72
MOTORCNTRLR : Kelly KDZ72651 (x2)
MOTORTYP : PMDC Brushed
NMLMM : 2/mid rear/30 hp
OLWH : 114.25 in
SUSPENSION : Fully Independent Inboard Pushrod
TIRE : Hoosier LCO 18X8.5
TRANSRATIO : 3.2 :1
WEIGHT : 625 lb
WHEELBASE : 70 in

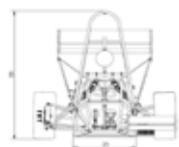


E215

Massachusetts Inst of Tech MIT Motorsports



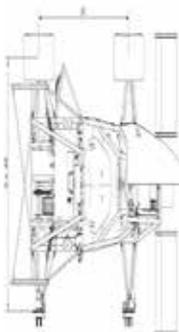
The MY16 vehicle utilizes a spaceframe construction powered by two electric motors that drive the rear wheels independently. Designing for a three percent weight reduction resulted in a goal of 560 pounds. A target center of gravity height of 12.5 inches was established. Prior to construction, a full-car CAD model was created. Goals of the MY16 vehicle were the following: Design the chassis with efficient load paths and improved ergonomics in mind, improve system integration and packaging, reduce backlash and compliance in the steering system, justify design decisions using more rigorous analysis, refine the car's first full aerodynamic package, and improve car's data acquisition for testing and simulation



BRAKE : Dual piston, fixed caliper with 4 outboard, floating rotor disk brakes
BSCD :
COOLING : Liquid Cooling, Side Mounted
DRIVE : 2 Motor, Chain Drive
ELECTRONICS : elithion Pro BMS, Custom Dash, CAN communication



ENGINE :
FR/RR TRACK : 1219.2mm
FRAME : Tubular Space Frame
FUEL SYSTEM :
FUEL TYPE :
MATERIAL : 4130 Chromoly Steel
MPD : 4000
MPT :
OLWH :
SUSPENSION : Double Unequal Length A-Arm. Pushrod Actuated Spring and Damper
TIRE : Hoosier 20.5x 7 -13
UNIQUE : Carbon Fiber Aero Package. Electronic Differential. Adjustable ARB
WEIGHT : 660 lb
WHEELBASE : 1524mm

**E216**

California Institute of Technology Caltech Racing



The 2015-2016 Caltech Racing Team, in its inaugural year, is competing in Formula SAE Electric in Lincoln, Nebraska. With no previous competition experience in the program but a large team of new dedicated students, the vehicle was designed completely from scratch this year. Looking at the outcome of the few previous electric competitions, we placed our primary goal to pass the rigorous technical inspection, of which, has had a historically low passing rate. With this in mind, our next goal was to design and build a vehicle that would finish all the events and was easy to manufacture and repair. Lastly, after accomplishing this, we looked to improve and optimize performance.



BRAKE : Wilwood Dynapro Single Piston
COOLING : Water Cooled, dual radiator
DRIVE : RWD, Chain Drive
ELECTRONICS : Elithion BMS, team developed control system and data acquisition
EMCAC : Li (NMC), 6.3 kWh
FR/RR TRACK : 1270mm / 1220mm
FRAME : Tubular Spaceframe
MATERIAL : 4130 Steel
MAXMOTORRPM : 6000 RPM
MAXSYSVOLT : 294 V
MOTORCNTRLR : UniTek Bamocar D3-400-400-RS
MOTORTYP : Enstroj EMRAX 208 Brushless AC, Synchronous
NMLMM : 1 Motor/Rear/80 kW
OLWH : 2980 mm / 1500 mm/ 1203mm
SUSPENSION : Double Unequal Length A-Arm. Pull Rod Actuated Coil Over Damper
TIRE : Pirelli 200/540-13 DSS/WS (Front) 250/575-13 DSS/WS (Rear)
TRANSRATIO : (5 :1)
WEIGHT : 250 kg
WHEELBASE : 1575 mm



E220

Univ of Manitoba Polar Bear Racing Electric



In previous years, the team has focused on developing a lightweight, low cost and high performance vehicle. However, the 2016 vehicle is special in that it first seeks to be functional, reliable and safe before moving to consider our following metrics. The major objectives for the 2016 vehicle are to create a reliable vehicle while maintaining a lightweight high performance design. There is a strong emphasis on identifying deficiencies in the previous vehicle, and making iterative changes to methodically improve designs. The areas that were proven to function reliably saw limited redesign. These systems include the main frame, powertrain and suspension. The most substantial design changes were for deficient areas of the 2015 vehicle such as the accumulator and driver controls. One of the more significant design changes is that our accumulator enclosure is completely laser cut and CNC bent to improve waterproofing and to mitigate interferences in high tolerance areas. Additionally, the high current path was completely redesigned to incorporate better maintenance disconnects and wire routing.



BRAKE : Wilwood GP320 calipers, SS rotors, Tilton 77 master cylinders
COOLING : Forced air cooled accumulator, water cooled motor and motor controller
DRIVE : Chain Drive, Rear Wheel Drive
ELECTRONICS : Orion BMS, Unitek BAMOCAR-D3 motor controller, Bender IR155-3204 IMD
EMCAC :
FR/RR TRACK : 1336/1323 / 52.6/52.1
FRAME : Steel Space Frame
MATERIAL : Chromoly
MAXMOTORRPM : 5500 RPM (6500 RPM for a few seconds)
MAXSYSVOLT : 298.8V
MOTORCNTRLR : Unitek BAMOCAR-D3
MOTORTYP : Brushless Synchronous Three Phase AC Motor
NMLMM : Single motor, behind driver, 100kW
OLWH : 3133/123.3, 1513/59.6, 1158/45.6
SUSPENSION : Front and rear independent short-long a-arm type
TIRE : Front : R25B 20.5 x 7.0-13 Hoosier, Rear : R25B 20.5 x 7.5-13 Hoosier
TRANSRATIO : 3.73
WEIGHT : 750lb
WHEELBASE : 1745/68.7



Canada

E221

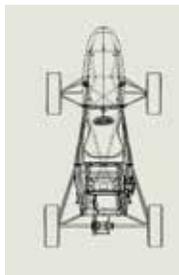
Portland State Univ Viking Motorsports



In 2016, Viking Motorsports will feature its 2nd iteration Formula Electric race car. Comprised of 20 individuals from multiple disciplines, the team is built on the mentality that basic engineering practices will produce practical and reliable products. This mindset has allowed the Vikings to improve on previous designs and build the team's fastest electric car to date.

Key improvements involve significant weight reduction (>100 lbs.) by means of chassis design and accumulator packaging, student designed ECU, and suspension system featuring adjustable anti-roll bars.

None of this would have been possible without the support of Portland State University, Jaguar Land Rover, and our many other sponsors. Special thanks to our advisers, Rob Paxton, Evan Waymire.



BRAKE : Brembo P34g, dual-piston
COOLING : Liquid Cooled Motor Controller
DRIVE : Remy HVH 250 HT
ELECTRONICS : Custom Student-Built ECU
EMCAC : Enerdel ME350-049 / Prismatic Cells / LiNiMnCoO2
FR/RR TRACK : 48 in / 51 in
FRAME : Space Frame
MATERIAL : 4130 Chromoly
MAXMOTORRPM : 5000 rpm
MAXSYSVOLT : 196.8 V
MOTORCNTRLR : RMS PM100DX Motor Controller
MOTORTYP : PMAC
NMLMM : Single Motor / Rear Mounted / 45 kW
OLWH : 113 in / 63 in / 42 in
SUSPENSION : Double Unequal Length A-arm, Push Front, Pull Rear, Anti-Roll Bars
TIRE : Hoosier 20.5 x 7.0-13
TRANSRATIO : 3.26
WEIGHT : 690
WHEELBASE : 66



United States

E222

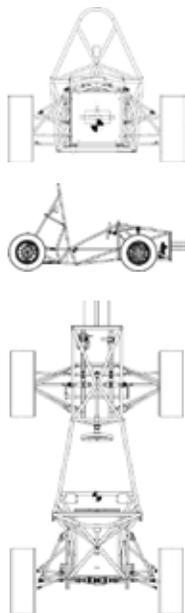
Univ of Waterloo

Waterloo Hybrid-Electric



The 2016 Waterloo Hybrid Electric vehicle was designed from the ground up and uses a steel tube frame with 13" wheels and a push rod suspension system. The suspension was designed to optimize response and stability of yaw, roll, and pitch while maintaining feedback of the vehicle to the driver. It has anti-Ackerman steering geometry and adjustable suspension through adjustable spring and damping rates, toe and camber angles, and anti-roll bar stiffnesses. The aerodynamics package includes front and rear wings to achieve 895 N of downforce and 146 N of drag at 80 kph.

The powertrain features in-hub 25 kW brushless DC motors for each rear wheel. The motors, wet-rotor cooling system, and planetary gearbox were custom designed for the vehicle. The accumulator module uses lithium iron phosphate pouch cells arranged for a total capacity of 5280 Wh and 180 V max output. Each motor is independently controlled using active torque vectoring to improve the yaw response of the vehicle. The control modules are designed around a daughter board containing a microprocessor and transceivers. All PCBs and firmware were developed in-house and communicate over CANbus.



BRAKE : Brembo P32G calipers
COOLING : Wet-rotor with Dextron III ATF
DRIVE : Planetary gearbox transmission
ELECTRONICS : Custom power, battery, vehicle, and driver control modules and firmware
EMCAC :
FR/RR TRACK : 1232 mm, 1220 mm
FRAME : Steel tube space frame
MATERIAL : Steel
MAXMOTORRPM : 3738
MAXSYSVOLT : 180 V
MOTORCNTRLR : Kelly Controls KHB14401
MOTORTYP : Brushless DC
NHLMM : 2, rear wheel in-hub, 25 kW
OLWH : 3036 mm, 1450 mm, 1250 mm
SUSPENSION : Push-rod
TIRE : Hoosier 20.5-7.0-13, R25B
TRANSRATION :
WEIGHT : 230 kg
WHEELBASE : 1575 mm

**E223**

Pakistan Navy Engineering College

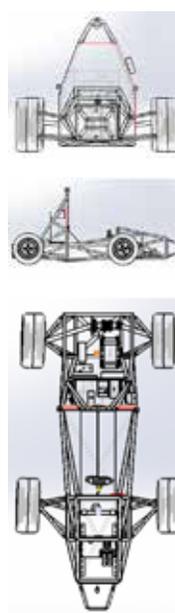
Formula Electric Racing - NUST



Formula Electric Racing NUST is participating for the first time in any FSAE circuit and is proud to have developed E-223 as our country's first FSAE Electric vehicle. The strategy employed in designing this vehicle places a great emphasis on cost, ease of manufacturability, reliability and safety.

Our chassis is a mild steel tubular space frame with unequal length double A-arms used for the suspension system. The brake system employs aluminum calipers and steel-made rotors, with holes drilled into it to reduce weight without compromising on strength. A limited-slip differential, mounted using mild-steel, is also used to increase traction during cornering. The electrical drivetrain employs a single air-cooled AC induction motor with a continuous power rating of 12kW. The drivetrain is powered by a single accumulator pack comprising of 108 LiPo pouch cells, configured to provide a nominal voltage of 65.7V. The electrical systems have been installed with proper protection circuits and necessary insulations to ensure overall safety.

We are determined to make meaningful contributions with our presence and aim to establish a solid foundation for future electric teams from our country.



BRAKE : 4 Wheel Disc brake with single Piston Calliper
COOLING : Fan Cooled
DRIVE : Chain Drive, Limited Slip Differential
ELECTRONICS : Elition Battery Management System, Intel Stick Base Monitoring System
EMCAC : Li(NiCoMn)O₂, 9096 kW/h
FR/RR TRACK : 1310/1280 mm
FRAME : AISI 1018 Mild Steel Space Frame
MATERIAL : AISI 1018 Mild Steel, 7075 Aluminium, Fiber Glass
MAXMOTORRPM : 7500
MAXSYSVOLT : 83 V
MOTORCNTRLR : Curtis 1238E-6801
MOTORTYP : 3 Phase Induction Motor (HPEVS AC-15)
NMLMM : 1/Between the Firewall and Differential/32.94 KW
OLWH : 3352x1828x1440
SUSPENSION : Double Unequal Length A-arms, Push Rods actuated Springs and Dampers
TIRE : 20x7.5-13 R25B
TRANSRATIO :
WEIGHT : 595 lb
WHEELBASE : 1610 mm



E225

Kennesaw State University

KSU EVT



This is the first time KSU EVT will compete in the FSAE-E series. Our design goal was to design a base platform that will successfully finish all parts of competition and allow future teams to build off of.



BRAKE : Front: Wilwood DynaPros Rear: Wilwood Powerlite **Master Cylinders:** Tilton 75-series
COOLING : cold
DRIVE : Single motor, 520 Chain driven spool
ELECTRONICS:
EMCAC :
FR/RR TRACK : Front: 50in Rear: 46in
FRAME : Steel tube spaceframe
MATERIAL : 4130 Chromoly
MAXMOTORRPM : 5000 RPM
MAXSYSVOLT : 294V
MOTORCNTRLR : Unitek Bamocar D3
MOTORTYP : PM-AC Brushless; Emrax 228
NMLMM : 1/rear/100kW
OLWH :
SUSPENSION : Ohlins TTX25, direct out front, push rod rear. Double a-arm
TIRE : Toyo Tires Proxes RR and RA1
TRANSRATIO :
WEIGHT : 700lbs
WHEELBASE : 65in

**E226**

Univ of Washington

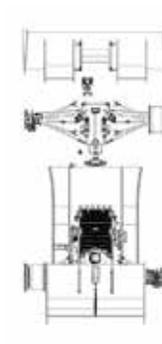
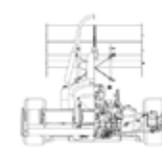
UW Formula Motorsports



For the 2016 UWashing Formula Motorsports Team, an iterative approach was implemented. After many drastic design changes in 2015, this year the team focused on fine tuning the previous year's design based on data collected from testing and new analyses. This has resulted in an electric car with much greater reliability and more testing time compared to previous years

Design Objectives

- Design every part and assembly as a system, with overall competition points in mind; team direction, design compromises, and decisions are made accordingly
- Reduction of part and assembly weight through improved understanding of load cases and analyses
- Utilize as much old and new test data as possible to validate theoretical models and concepts
- Provide and utilize ample testing time to extract maximum vehicle performance reliability



BRAKE : Floating Cast Iron, Hub Mounted
COOLING : Dual Liquid/Air Cooled, Side Mounted
DRIVE : Dual-Motor RWD Torque Vectoring, Single Stage Planetary Gearbox
ELECTRONICS : Torque Vectoring, 70 Channel @ 200Hz Logging, Telemetry
EMCAC : Lithium-Ion Polymer / 5.921kWh
FR/RR TRACK : 1270/1193.8 / 50.0/47.0
FRAME : Full Carbon Fiber Monocoque, Al Honeycomb
MATERIAL : Toray T700/2510 CFRP Prepreg, Plascore PAMG-XR1 5052 Aluminum Honeycomb
MAXMOTORRPM : 6000
MAXSYSVOLT : 264.6
MOTORCNTRLR : UniTek Bamocar D3-400-400-RS
MOTORTYP : Enstroj EMRAX 207 Medium Voltage CC / Brushless AC Synchronous
NMLMM : Dual Rear Motors @ 80kW each
OLWH : 2980,1469,1278 / 117.3,57.8,50.3
SUSPENSION : Double Unequal Length A-Arm. Pull Rod Actuated
TIRE : Hoosier LCO 6.0/18.0-10
TRANSRATIO : 3.71 :1
WEIGHT : 535
WHEELBASE : 1536.7/60.5





With BR16, we switched to an all-electric drivetrain from our usual hybrid setups and used two Emrax 207 MV motors coupled to 4:1 planetary gearboxes for independent direct-drive on rear wheels, saving us the weight of a differential and sprocket system. The battery box is built around 86 AMP20 pouch cell batteries wired in series to provide a nominal 284 V and 200 A output, sufficient to take the motors up to 6000 RPM and 160 kW. Using 21 in outer diameter 8 in wide Hoosiers in the rear, BR16 is able to accelerate from 0 to 60 mph in 2.5 s and reach a top speed of 90 mph. On the vehicle dynamics front, we have opted for a neutral motion ratio around 1.01 both in the front and rear. We used 85 lbs/in springs in the front and 110 lbs/in springs on the rear for natural frequencies of 2.52 Hz and 2.4 Hz, respectively, with the option of switching to stiffer springs for tracks that require less compliance. We decided to forego the anti-roll bars, since we were able to hit a roll gradient of 0.57 deg/g both in the front and rear, thanks to a 250 mm CG height courtesy of the battery box positioned at the lowest plane on the car and a 550 lbs dry total weight.



BRAKE : Single caliper with dual pistons on all wheels
BSCD : N/A
COOLING : Water cooled, air-to-water heat exchanger
DRIVE : 4:1 fixed ratio independent rear wheel direct drive
ELECTRONICS : BeagleBone Black, Bamocar D3 400
ENGINE : 2 x Emrax 207 MV
FR/RR TRACK : (F) 1263/50, (R) 1187/47
FRAME : 4130 Steel, TIG welded
FUEL SYSTEM : N/A
FUEL TYPE : N/A
MATERIAL : N/A
MPD : 6000
MPT : 6000
OLWH : (L) 2650/104, (W) 1452/57, (H) 1149/45
SUSPENSION : Double wishbone, pullrod suspension. Adjustable camber, toe and ackermann
TIRE : Hoosier R25B
UNIQUE : Retro aluminum body, torque vectoring system, adjustable camber
WEIGHT : 680 lbs
WHEELBASE : 1549/61



United States



Major design goals for this year's iteration were to reduce the mass of the vehicle yet again while increasing performance and reducing cost. Increasing the overall durability and safety of the car was also a priority. The electrical team spend copious amounts of time reducing the size, cost and number of components needed to make the car safely run while increasing functionality. The accumulator for this car was also overhauled to make a functioning 300V LiPo battery pack a reality. After all the thought and work that has been put into the car, this car is turning out to be an easy car to work on as well as an easy car to adjust and tune.

The primary goal of this iteration of the suspension system was to remove the design faults present in the previous iteration. These design faults were related to the inability of the rear suspension to rectify the forces present, thereby leading to bending forces and consequently failure of the a-arms.



BRAKE : Wilwood Calipers
BSCD : Enstroj Emrax HV228
COOLING : Dual Radiator
DRIVE : ELECTRIC
ELECTRONICS : Custom
ENGINE : EMRAX 228
FR/RR TRACK : 1219/1168 mm (48/46 in)
FRAME : 4130 Chromoly
FUEL SYSTEM : Battery
FUEL TYPE : LiPo
MATERIAL :
MPD : 134
MPT : 177
OLWH : 2575, 1219, 1060 mm (101.38, 48, 42 in)
SUSPENSION : F/Pullrod R/Pushrod
TIRE : Fr 20.5x6-13 R25B; Rr 20.5x6-13 R25B
UNIQUE : Custom BMS and Control System
WEIGHT : 690
WHEELBASE : 1550mm (61 in)



United States

Czech Technical Univ of Prague

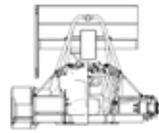
eForce FEE Prague Formula



This year was a year of changes for our team. The main objective was to lower the overall weight of the car by 70 kg reaching 200 kg without the driver. The accumulator unit was completely redesigned. We now use much lighter Li-ion batteries. To shed some weight but also improve manoeuvrability, we switched to smaller 10" rims. This season, the car will be very mobile thanks to an improvement in the powertrain.

We decided to implement four by four drive using independent motors. This will help to improve the traction, agility and manoeuvrability. We are using high rev motors. They are integrated in the wheel hub in the front utilizing planetary gearbox and mounted to the frame in the back. Both the front motors produce 8 kW and the back motors produce 25 kW.

Due to the changes in the rules, the aero package was completely redesigned. The goal was to gain as much downforce as possible despite the given restrictions.



BRAKE : Front: Dia. 195mm, ISR 22-048-0B, Rear: Dia. 185mm, ISR 22-049-0C

BSCD : 4x25mm, 2x22mm

COOLING : Motor and inverter water cooled with separated radiators

DRIVE :

ELECTRONICS : 7 self developed ECUs: Pedal ECU, Steering wheel ECU, BMS, Motor Inverter

ENGINE :

FR/RR TRACK : 1286mm/1200mm

FRAME : tubular spaceframe with CF reinforcements

FUEL SYSTEM :

FUEL TYPE :

MATERIAL :

MPD : 60kW

MPT : 150Nm

OLWH : 2778/1380/1190mm

SUSPENSION : Ohlins TTX

TIRE : Avon A92, 185x410xR10

UNIQUE :

WEIGHT : 590

WHEELBASE : 1540

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2016 FORMULA SAE **KEY PLAYERS**

There is a large group of individuals who make sure the numerous details are completed to make a successful event.

EVENT ORGANIZERS - SAE INTERNATIONAL

- Bob Sechler, Manager, Education Relations
- Kaley Zundel, Manager, Collegiate Design Series Programs (FSAE, CSC, Supermileage)
- Sam Barill, Manager, Collegiate Design Series Programs (Baja SAE & Aero Design)
- Amanda Paciorkowski, University Programs Developer
- Sara Guffey, University Programs Coordinator
- Martha Tress, Manager, Recruitment Sales and Sponsor Relations

SCCA LIAISON

- Clancy Schmidt
- Howard Duncan

FSAE COURSE DESIGNER

- Roger Johnson

TRACK ANNOUNCER

- Raleigh Boreen

TECHNICAL INSPECTORS LEADS - COMBUSTION

- Matt Petty
- Alex Buchka

TECHNICAL INSPECTORS LEADS - ELECTRIC

- Danny Bocci
- Lance Turner

EVENT CAPTAINS

- Brake - Ali Zangeneh
- Noise - Gary Newton
- Tilt - Gary Young
- Practice - Jim McNeil and Will Hildebeitel
- Fuel - Ken Krenk and Janice Hueske
- Scales - Janice Hueske
- Presentation - Rachel Weinstock and Jacqueline LeBrun
- Design - David Redszus
- Chief Design Judge - Steve Fox
- Cost - Suzy Zukowski and Leo Abels
- Acceleration - Tim Gornik and Quinten Jordan
- Skid Pad - Joe Losito
- Autocross - Jacob Homer
- Endurance - Lawrence Raitinger
- Chief National Scorekeeper - Steve Sayovitz

VOLUNTEERS CONFIRMED AS OF MAY 16, 2016

- Abels, Leo • Ahlman, Dennis | Attravanam, Siddarth | Aunkst, Isaac | Austin, Joseph | Bambula, Michael | Bayless, Micah | Bell, Michael | Bentley, Aaron | Berg, Chris | Bocci, Dan | Bower, Glenn | Bowling, Bruce | Brodsky, Ethan | Brown, Sandi | Burkey, Billy | Campbell, Chris | Canupp, Patrick | Caprarella, Claudio | Cater, Marko | Chahin, Oscar | Chegash, David | Christianson, Jeff | Colon, Alba | Detweiler, Jason | Dilworth, Damon | DiMarco, Ben | Donovan, Joe | Drew, Christopher | Ducharme, Stephen | Duffy, Phil | Duncan, Howard | Duncan, Linda | Elikor, DeAnna | Ellefson, Bryan | Erb, Dave | Eugenio, Alicia | Feyerherm, Derek | Ficke, Jon | Firestone, Adam | Fisher, William | Flodman, Hunter | Francis, Bill | Garcia, Oscar | Gill, Doug | Gill, Lori | Gilmore, Zach | Giovenale, Rob | Goldstein, Zachary | Graham, Thomas | Greenwood, Reed | Gregory, Dalton | Hahn, Christoph | Harasym, Steve | Haskell, Matthew | Hatch, Alyssa | Haynes, Judy | Hernandez, Mario | Hildebeitel, Will | Hodgins, Doug | Hogan, Shana | Holifield, Phillip | Homer, Jacob | Horner, Kurtis | Hueske, Janice | Hurwitz, John | Ingles-Nguyen, Ricky | Jala, Sriram | Johnson, Sam | Jordan, Quinten | Jordan, Wendy | Kalkwarf, Ron | Khattar, Puneet | Knop, Donald | Koester, Tony | Krenk, Ken | Kromberg, Russ | Kuzela, John | Lacey, Robert | LaRondeau, John | LeBrun, Jacqueline | Lewis, Todd | Lingenfelter, Kevin | Loehring, Mike | Losito, Joe | Mackert, Ross | Madsen, Martin | Magnuson, Dennis | Magorian, Jerry | Malousek, Joe | Martin, Benjamin | McCagg, Dave | McConnel, Julia | McFadden, Andrea | Messier, Paul | Moore, Trey | Moravec, Tim | Nee, James | Niemann, Jason | Niner, Adam | Ohlemeier, Jerry | Oltremari, Brett | Patek, Tim | Patwardhan, Amey | Peters, Derek | Petty, David | Petty, Matt | Pop, Mihai | Rademacher, Michael | Rainey, Cheyendrick | Raitinger, Lawrence | Rasmussen, Terry | Rebottaro, Max | Redinger, Criag | Redinger, William | Redszus, David | Reimer, Andrew | Rhodig, Josh | Rimel, David | Rosenkrantz, Steve | Hemanth, S. | Sayovitz, Steve | Schieb, Eric | Schmidt, Aaron | Schmidt, Clancy | Schraeger, Reiley | Schulberg, Jason | Sennett, Brian | Sharma, Ram Krishan | Sheehan, Sean | Shores, Ryan | Skulski, Leszek | Smith, Chuck | Snaza, Wesley | Spandl, Everett | Spohn, Brian | Steingrimsson, Baldur | Stiffler, Abram | Taylor, Rick | Thakur, Vishal | Thirkateh, Pramey | Thomas, Larry | Thornton, Megan | Turner, Lance | Van Duyn, Kelly | Vujic, Kristina | Wageman, Daniel | Walker, Mark | Watson, Michael | Weinstock, Rachel | Wheaton, Dave | Widhalm, Witt | Williams, Dave | Winans, Ashley | Wood, Grady | Yaeger, Christian | Yaeger, David | Yost, Mark | Young, Gary | Young, Karl | Zangeneh, Ali | Zieman, Mike | Zukowski, Aaron | Zukowski, Eden | Zukowski, Suzy

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First Competition - 2004
Website: www.saebrasil.org.br/eventos/programas_estudantis/

FORMULA SAE ITALY

First Competition - 2005
Website: www.ata.it/content/event-formula-ata/formula-sae-italy-formula-electric-italy-2015

FORMULA STUDENT

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First Competition - 2009
Website: www.fsaustria.at

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First Competition - 2006
Website: www.formulastudent.de/

FORMULA SAE JAPAN

First Competition - 2003
Website: www.jsae.or.jp/formula/en/

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