Cornell Baja SAE is an engineering project team that builds, designs, tests and races an off-road vehicle each year. The Cornell Baja SAE team was founded in Fall 2003 and participates in the annual SAE International Baja Series competitions against upwards of 200 teams from around the world.

The project promotes the application of the theoretical concepts in a practical environment while balancing budget and design requirements. The team is made up primarily of undergraduate students with a handful of graduate members. Although most of the members are engineers, the team represents eight majors and three of Cornell’s seven colleges.
50 MEMBERS.
7 SUB-TEAMS.
1 GOAL.

TEAM.
THE COMPETITION

WHAT DO WE DO?
We design and build an off-road vehicle to compete in the SAE Collegiate Baja Design Series.

HOW DO WE WIN?
The object of the competition is for a ficticious firm to accept one team’s design for manufacturing; simulating the tasks involved in introducing a new product to the consumer industrial market.

WHO PARTICIPATES AT COMPETITION?
There are three North American competitions annually; each draws 100 international teams for a four-day competition of static and dynamic events. These competitions require students to balance design and cost with dynamic performance, while following a strict set of safety guidelines and standardize rules.

WHAT HAPPENS AT COMPETITION?
The first two days of competition consist of the Static Events, focused on the cost report, sales presentation, and design report. The last two days are devoted to the dynamic events. The third day of competition focuses on time trial events, including maneuverability, acceleration, and a hill climb or tractor pull. Additionally, each competition includes a unique hosts’ choice event which can be: hill climb, suspsion and traction or rock crawl.

The fourth and final day is reserved for the Endurance Race. This culminating event is worth the most points and is the ultimate test of a teams design, fabrication, and durability. All 100 teams race wheel-to-wheel on a single obstacle-strewn track to complete the most laps in the four-hour time frame.
2018 - 2019 TIMELINE

AUGUST
RECRUITMENT

SEPTEMBER
NEW MEMBER TRAINING, DESIGN & INNOVATION PHASE

OCTOBER
DETAILED DESIGN & ANALYSIS, FINAL DESIGN REVIEW

NOVEMBER - DECEMBER
MANUFACTURING REVIEW, FABRICATION BEGINS

JANUARY
FRAME & SUSPENSION FABRICATION COMPLETED, MAJORITY OF PARTS MACHINED

FEBRUARY - MARCH
CAR COMPLETE, TEST CYCLE BEGINS, COST & DESIGN REPORTS SUBMITTED
**SPONSORSHIP LEVELS**

**ELITE**
($10,000+) Elite sponsors receive the most prominent logo placement on the car, their own featured description on the website’s sponsor page, and placement on our design posters at competition. We are happy to work with Elite sponsors on social media content. Elite sponsors will also receive t-shirts, a large poster and framed picture of the team, and other promotional products.

**GOLD**
($5,000-$9,999) Gold sponsors have an extra-large logo on the car, a short description on our website’s sponsor page, and placement on apparel and other promotional products. In addition, gold sponsors are featured on our design posters at competition. You will also receive t-shirts and a framed picture of the team.

**SILVER**
($2,000-$4,999) Silver sponsors receive a large logo on the car, website, apparel, and other promotional products. You will also receive t-shirts and a framed picture of the team.

**BRONZE**
($500-$1,999) Bronze sponsors receive a logo on the car, website, and apparel. Sponsor page will link to company website.

**CONTRIBUTOR**
($1-$499) Contributors receive a logo on the car and on the sponsor page of the website.
PRIOR SUCCESSES

2018
- 2nd Place Overall: Mike Schmidt Memorial Award
- Kansas Competition: 1st Place
- Oregon Competition: 2nd Place
- Maryland Competition: 3rd Place

2016
- 3rd Place Overall: Mike Schmidt Memorial Award
- California Competition: 2nd Place
- Tennessee Competition: 2nd Place
- Rochester Competition: 4th Place

2015
- 2nd Place Overall: Mike Schmidt Memorial Award
- Maryland Competition: 1st Place
- Auburn Competition: 2nd Place
- Oregon Competition: 4th Place

2014
- 1st Place Overall: Mike Schmidt Memorial Award
- Illinois Competition: 1st Place
- Texas Competition: 3rd Place
- Kansas Competition: 4th Place
The ergonomics subteam is tasked with creating a seat and steering wheel that fit the driver’s body and reduce musculoskeletal fatigue during competition events, particularly the 4-hour endurance event. We combine ergonomic research with our own discomfort testing methodology to maximize driver support. To ensure the safety of our drivers, as well as critical mechanical components, we also build durable body panels that adhere tightly to the frame. The goal of the ergonomics subteam is to maximize driver performance, without compromising cost or weight, to bring the team one step closer to a win.
The frame subteam is tasked with designing and manufacturing the roll cage and main structure of the Baja car, creating a safe, protective barrier between our driver and the harsh obstacles of the course. The frame also must attach all of the other components of the car through a solid foundation. We must work with all of the other subteams to verify that their designs fit within the bounds of our frame, as well as the mountings for their systems. By working to create as light of a frame as possible while still providing the safety and strength necessary, we can reduce our weight and create the fastest, lightest car possible.

The unsprung subteam works primarily on the brakes system, and also does some work on the wheel assemblies. We design and manufacture custom master cylinders and brake calipers, as well as the brake pedal. Our goal is to create a system that will consistently deliver the required braking torque while minimizing weight and maximizing ease of maintenance. In particular, this year the subteam is focused on testing to ensure our load cases for analysis of the system are correct.
Brian Richard, Eric Berg, Joe Fetter, Chris Oh, Amber Zhen, Nicole Lin, Katie Barajas, Sujith Napa Ramesh, Juan Joel Albrecht

The Electronics sub-team is responsible for developing our custom suite of testing equipment. In order to validate the design for a component, we run it through a battery of tests. Nothing is added to the car unless it has gone through our thorough design and testing process. We collect essential data in real-time competitive environments and bench-tests and extend the technological capabilities of the vehicle as a weight saving measure.

Francesco DiMare, Vignesh Gnanasekaran, Marielle Mullon, Calvin O’Brien

The Suspension sub-team develops the fully independent suspension system that helps our car negotiate large rocks, jump over logs, and maneuver hair pin turns. We custom design our links, ball joints, steering rack, uprights and bushings throughout the fall semester, then manufacture and tune our springs and dampers throughout the spring semester to develop the fastest and most maneuverable car. We TIG weld then heat-treat our all-aluminum suspension, which saves 6 pounds compared to the steel alternative - making our car one of the lightest at competition.
Liana Margolese, Boya Zhang, Andrew Joesfov, Mark Brancale, Kenneth Cheung, Yeolim Jo

The drivetrain subteam is primarily responsible for efficiently transferring torque from the engine to the wheels. This is done using a custom designed CVT and gearbox to provide an adequate torque reduction. In addition, we are in the process of implementing a gearbox dynamometer, in order to gauge efficiency of our secondary reduction. We also design the wheel hubs which serve as the interface between the suspension and the wheels. Overall, we try to maximize powertrain efficiency, responsiveness and performance.

Yubin Kim, Ben Dickstein, Snigdha Kasi, Divya Agrawal

The Business sub-team acts as the liaison between the team and the Cornell community. We are responsible for recruiting new team members at the beginning of each semester, compiling a cost report for the competition, conducting purchases for the team, contacting alumni, corporations, and members of the community for sponsorships, designing and distributing public relations material, planning team travel, designing apparel, and maintaining the team website.
SPONSORSHIP AND...

CORNELL

RACING

THE BENEFITS OF PARTNERING
We would like to extend our thanks to our past and present sponsors. Their generous contributions, whether they are monetary, material, or service, make this continuation of our project and its success possible.

*For more information about our team and to stay updated on our progress, please:*

- **Visit our WEBSITE** [cornellbaja.com](http://cornellbaja.com)
- **Find us on TWITTER** [@CUBaja](https://twitter.com/CUBaja)
- **Send us an EMAIL** cornell.baja@gmail.com
- **Check out our YOUTUBE** CornellBaja
- **Look us up on INSTAGRAM** @cornellbajaracing

**BENEFITS**

- Tax deduction
- Recruiting visibility on campus
- National visibility at competition through logo placement
- Opportunity to showcase or further develop a company’s new products
- Opportunity to support students engaged in learning through collaborative interdisciplinary hands-on team projects