



# WOLFPACK MOTORSPORTS



## Who We Are

Wolfpack Motorsports (WM) is a North Carolina State University student organization established in 1997. The group participates in “The Collegiate Design Series”, a program overseen and sponsored by the Society of Automotive Engineers International (SAE) (<http://students.sae.org/>). WM consists of two teams; one competes in the Formula SAE series and the other in the Baja SAE series. Currently our team consists of about 30 student volunteers, most of which study engineering. However, we are open to all majors and years including graduate students. Students involved with WM gain real world experience in many areas beyond engineering. WM is proud that its members represent both NC State and the Mechanical & Aerospace Department not only through their excellent performance during international competitions but also through Outreach, Research and Leadership.

## Outreach

WM members often spend their summers organizing a summer program to teach high school students about the world of engineering and motorsports. They learn the mechanics of cars, road racing, off-road racing and many real applications of engineering. The highlights of the camp include a tour of the Richard Childress Racing campus, time trials in a Baja SAE car and an afternoon racing karts.

As well as the summer program, WM cooperates with the Centennial Campus Middle School by speaking to middle school students from all over the state about NC State University and the College of Engineering. Our members, who are driven by their passion for motorsports, love to pass on their enthusiasm to younger students.

## Research

Students in WM are responsible for designing the entire car and then building it gaining hands on experience. Not only do they become proficient in the use of CAD and FEA software such as SolidWorks and Ansys but they actively conduct research as undergraduate students. They're research is often in the field of automotive engineering. Recent topics include dry sump lubrication, fracture mechanics of transmission shafts, suspension simulation, and chassis analysis using FEA.

## Leadership

The engineering and teamwork experience that members gain make them very attractive to employers. Each team is responsible for managing their respective car's design, construction and testing cycles. However, both Formula and Baja must share the same tools, equipment and budget. Team captains are exclusively responsible for deadlines, registration, documentation and asset management. They graduate with a real knowledge of how to manage a team of engineers and also how to make deadlines. Moreover, they understand how to motivate a team made of volunteers.

## Alumni

Subsequently, many alumni have gone on to work for very successful companies. The experience they have gained with WM is valued in the engineering community. Not only because of their enhanced knowledge of vehicle systems and behavior but also for their excellent management skills and leadership. Recent graduates have been employed by Indigen Armor, Force Protection, 3Pheonix, Penske Racing, Richard Childress Racing, Volvo Trucks, Honda R&D and Google.

Contact: [sponsorship@wolfpackmotorsports.com](mailto:sponsorship@wolfpackmotorsports.com)

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## About Formula SAE

The Formula SAE competition is for students to design, build, and race a formula style racecar and compete with it against other students from all over the world. The rules are very flexible, allowing a great deal of design and engineering creativity. Focus is on suspension and engine performance while remaining as light as possible.

The WM Formula car is a true racecar capable of very high performance. Power is provided by a Honda 599cc F4i DOHC 4-cylinder motorcycle engine controlled by a MoTeC M400 standalone ECU. The engine runs on E85 and output is boosted by a Garrett turbocharger. The chassis is of tubular steel space frame construction with carbon fiber body work and fully adjustable double wishbone suspension front and rear. The differential is a Taylor Race Engineering Limited-Slip unit in a lightweight housing.

		Competition Results
• Horsepower	93 HP	2011: 4 <sup>th</sup> Acceleration
• Torque	74 ft-lb	2010: 6 <sup>th</sup> Acceleration; 10 Fuel Economy
• 0-60	3.218 s	2009: 2 <sup>nd</sup> Acceleration; 7 <sup>th</sup> Skidpad
• Top Speed	98 mph	2007: 1 <sup>st</sup> Acceleration; 16 <sup>th</sup> Overall
• Weight	417 lbs (wet)	2006: 1 <sup>st</sup> Skidpad; 6 <sup>th</sup> Overall
• Acceleration G's	.97 g	2005: 7 <sup>th</sup> Overall





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## About Baja SAE

Baja SAE, like Formula SAE, is also a collegiate design competition organized by the Society of Automotive Engineers. In Baja SAE students design and build an off-road vehicle that must survive rough terrain such as rocks, mud, jumps, logs and sometimes water. This competition focuses on the chassis, drive train and suspension design of the car. The motor is restricted to an unmodified 10 horsepower Briggs and Stratton. Students are challenged to design a rugged and reliable off-road capable car, while still keeping cost and maintenance affordable for the theoretically consumer.

The WM Baja SAE car is a steel tube frame off-road buggy. The car's drivetrain consists of a Briggs and Stratton 10 horsepower engine followed by a Gaged Engineering continuously variable transmission (CVT). The output from the CVT is then directed into a planetary gear box further increasing the torque output before going into a final chain drive. The vehicle also has fully independent suspension with 12 inches of travel. This innovative suspension utilizes a double a-arm setup in the front, and 3 link system in the rear.

		<b>Competition Results</b>
• Engine	10 hp Briggs and Stratton	2011: 9 <sup>th</sup> Overall, 17 <sup>th</sup> Overall, 3 <sup>rd</sup> Rock Crawl; 9 <sup>th</sup> Cost; 8 <sup>th</sup> Design; 10 <sup>th</sup> Endurance, Maneuverability, Hill Climb 2010: 4 <sup>th</sup> Design; 10 <sup>th</sup> Overall 2009: 5 <sup>th</sup> Cost; 10 <sup>th</sup> Tractor Pull 2005: 4 <sup>th</sup> Hill Climb; 6 <sup>th</sup> Suspension and Traction 1998: 2 <sup>nd</sup> Overall
• Top Speed	35 mph	
• Suspension Travel	Front: 12 in Rear: 12 in	
• Weight	375 lb	
• Ground Clearance	10 in at ride height	

This past year the WM Baja team was grateful to have an opportunity to volunteer in rebuilding a church that was severely damaged by the May 22 tornado in Joplin Mo. The team arrived in Joplin the day after their nearby Kansas competition, set up camp, and drove around until they found a place to volunteer. They worked for three days before heading to Illinois to their last competition of the year. "We were thankful just to have the opportunity to volunteer and help out in such a horrible natural disaster."

– Tyler Carter

(The image to the right is a house close to where the team worked. It shows the spirit and charter of Americans even in the face of disaster.)



An article about this experience was featured in the College of Engineering News at NCSU

and can be found at: [http://www.engr.ncsu.edu/news/news\\_articles/baja2011aug.html](http://www.engr.ncsu.edu/news/news_articles/baja2011aug.html)

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## Sponsorship Opportunities

Building a successful racecar takes more than time and knowledge. Since WM is a student-led organization with minimal departmental and university support, it relies almost exclusively on private and corporate sponsorship to fund the design and production of the cars. It takes approximately \$40,000 annually to build the cars and attend competitions. The students volunteer hundreds of hours, but costs of tools, parts, and materials quickly add up. This is where the sponsors come to our rescue. Without our sponsors, this program could not exist and that is why we rely heavily on our proud sponsors for both monetary support and donations of parts and supplies. It takes the support of people and companies like you to help make Wolfpack Motorsports a continued success. Some benefits of sponsorship include advertising exposure, student recruitment and a tax credit for all donations. The cars are routinely featured in printed publications, seen at regional motorsports events, and of course are known for being top performers internationally. Additionally, due to the sponsor's involvement in WM, many sponsors seek graduates for employment opportunities because of the relationships that are formed.

## Sponsorship Tiers

### Platinum Team Sponsor- \$5,000

(Only one available per year)

Priority placement of decals on the vehicle trailer and tow vehicle.

Special appearances of cars and team members at the sponsor's place of business or trade show.

Display company banner/posters (provided by your company) at all Baja and Formula competitions and educational events.

Company name and or logo placed on all clothing, printed and online material.

Thank you plaque with team picture.

Invitation to all WM Events.

### Silver Team Sponsor- \$1500

Company logo placed on racing cars.

Company logo placed on all clothing, printed and online material.

Invitation to all WM Events.

### Gold Team Sponsor - \$3500

Large company logo placed on racing cars.

Display company banner/posters (provided by your company) at all Baja and Formula competitions and educational events.

Company logo placed on all clothing, printed and online material.

Invitation to all WM Events.

### Bronze Team Sponsor-\$500

Company/Personal name listed on racing cars.

Company/Personal name placed on all printed and online material.

Invitation to all WM Events.

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## Ways to Give

Wolfpack Motorsports is heavily dependent on charitable gifts to maintain its high quality program. Gifts like yours allow Wolfpack Motorsports members to pursue their passion of motorsports and develop into industry leading engineers.

All donations are **100% tax deductible** and will have a receipt issued for the amount given for tax purposes.

**By cash:** Cash gifts can be made simply by writing a check payable to:

NC State Engineering Foundation, Inc.  
**FOR:** Wolfpack Motorsports

**Mailing Address:**

Daniel A. Pietrzak  
Engineering-Dean's Office  
Director of Development, Mechanical & Aerospace Engineering  
NCSU Campus Box 7901  
Raleigh, NC 27695

For assistance, please call the NC State Engineering Foundation Office at (919) 515-7458 or toll free at (866) 316-4057.

**In Kind:** Gifts of property such as hardware, tools, supplies, materials, parts, and machine time can be donated directly to Wolfpack Motorsports serving the same purpose as a cash donation. These gifts are also **100% tax deductible** and will receive a receipt for the net worth of the donation.

## Thank You For Your Support

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