SAE Club
Wright State Chapter

- Dr. Craig Baudendistel (SAE Baja)
- Dr. Scott Thomas & Dr. Mitch Wolff (SAE Aero)
Society of Automotive Engineers

• Join Here $35:
  https://www.sae.org/participate/membership/join

• Scholarships:
  https://www.sae.org/participate/scholarships

• Training:
  https://www.sae.org/learn/professional-development/gdt
Competition – AWD Single Seat Offroad Vehicle

• Technical Inspection with Briggs Motor check
  • No engine modification other than adding an alternator
• Sales/Business Presentation (Shark Tank)
• Design Presentation
• Top Speed/Acceleration
• Hill Climb/Sled Pull
• Maneuverability/Suspension
• 3 hour Endurance Race

https://www.youtube.com/watch?v=bIsoKHnQFZc

We also tend to go to Midnight Mayhem in October.
SAE Baja

- 2004-2005: Me
- 2006-2007: Rochester NY
- 2015-2016: Waitlist
- 2016-2017: Ghosted
- 2017-2018: Kansas
- 2018-2019: Tennesee Tech
- 2019-2020: COVID
- 2020-2021: Louisville
- 2021-2022: Year off

- Typically 6 seniors: Frame Team, Drivetrain Team, Suspension Team
• Kansas – could fit a 6’6” and a 5’3” student IN COMPETITION
• Tennessee Tech

• Paint Rule: Any color you want as long as it’s black
Louisville KY, AWD with “gearbox”
Typical Car

- Combo of custom designs with 4-wheeler parts. We’ve done:
  - Bottomline: NO OFF-THE-SHELF COMPONENTS EXIST FOR 10HP
    - custom is better, but takes longer
    - off-the-shelf is a little more “redneck” engineering. Make it work
Skillset

• Welding Experience is highly valued
  • Else we have to partner/beg a local company

• Machine shop – CNC mill/lathe

• Metal Fab
  • Tube Bending
  • Fish-mouthing
  • Grinding
  • Sheet Metal

• While not required, it’s helpful. CANNOT be afraid to try, fail, and accept criticism. Figure it out.
Typical Year

• Driver envelope frame designed and built September-December.
• A-arms/trailing arms/suspension members designed September-December
• Drivetrain designed September-December
• Build January-March
• Testing March-May
• NO VACATIONS! NO THANKSGIVING BREAK, CHRISTMAS BREAK, SPRING BREAK, Competition is AFTER graduation, don’t start your full time job yet!!
• Afterwards, all the expertise leaves and we start brand new the next year.
Switch from Capstone only to Club

• While it can be done, it’s a lot for 6 students. A club would take some of the trivial things off the senior’s to-do list.
• Main item – FUNDRAISING!
• Typically, we get $5000 + $2500 (OSGC + MME)
  • Travel (hotel/truck rental/gas) ($2000)
  • Raw Material
  • Registration ($1500)
• Underclassmen handle the Sales Presentation

• Great in theory, but people leave when they get busy. No carrot to beat you with!!
Side Projects

- CVT Test/Tune Stand
- Brake Light bracket
- Seatbelt mounts
- Shoulder belt slide stop
- Throttle mod
- Kill switch brackets
- Fire extinguisher bracket
- Numbers

- Tow Hitch
- Fuel tank mount
- Body Panels
- Jigs
- Wiring Kill Switch/Brake light
- Brake line routing
- Gas Pedal/throttle routing
Ways to Be Competitive

• While I like students to be creative and try new things, you typically trade performance.

• Weight is EVERYTHING. You only have 10 hp.
  • If you are over 6’, sorry, you aren’t driving in the competition
  • Shifting is overrated and RARELY works. CVT is used by 95% of cars
  • A reduction gearbox is needed for torque/hp balance
  • Optimized design is probably a 2-speed gearbox (no reverse)
  • Hydraulics are too heavy
  • Custom Wheels/Dirt bike tires
  • Mountain Bike brakes? (must lock all 4 on pavement at full speed)
  • Carbon fiber upper a-arms
What can you do??

• Go to the competitions!!!!!!!!!!!!!!!
  • Tennessee Tech, May 12-15 (5.5 hour drive)
  • Rochester NY, June 2-5 (7 hour drive)

• Download the App: Baja SAE
• Check out the website: www.bajasae.net

• READ THE RULES! YOU WILL NOT PASS TECH IF YOU DON’T (LITERALLY) KNOW THE RULES BY HEART
• Employers LOVE this project
• You will learn LOTS of hands-on skills
• Difficult project, but very rewarding (Baja community is EXCELLENT)