SUN DEVIL MOTORSPORTS

New Membership Packet 2022-23 Season

FACEBOOK.COM/ASUFSAE @SUN_DEVIL_MOTORSPORTS FSAE.ENGINEERING.ASU.EDU

Table of Contents

1. Introduction
2. Executive Leadership
3. Engineering Sub-Teams
4. Operations Sub-Teams
4. Membership Benefits
5. Where to Start
6. Membership Expectations

Introduction

Sun Devil Motorsports - Formula SAE, located at Arizona State University's Tempe campus, was formed to give students of all majors the ability to use their classroom theory in a real world application. This multidisciplinary organization is run like a small business in order to create a new Formula style race car each year with the purpose of competing at the annual Formula SAE Student competition.

The premise of the competition is to build a prototype that could be purchased by amateur sports car drivers for national autocross events. In return for each member's talent and hard work, the organization provides opportunities to gain greater insight into the engineering profession by sponsoring meetings that bring practicing engineers to the campus, arranging field trips to engineering establishments, developing business presentations to imitate pitches for earning investment capital to mass produce the car, and engaging in off campus events to promote team building.

SAE International, initially established as the Society of Automotive Engineers, is a U.S.-based, globally active professional and standards organization for engineering professionals in various industries.

Executive Leadership

Chief Engineer

The chief engineer is ultimately responsible for the vehicle design and engineering practices undertaken throughout the design process. Every nut and bolt must cross their desk before being put on the car.

President

The president is responsible for developing and implementing long-term institutional goals for the team while serving as the link between student members and ASU.

Chief Operations Officer

Responsible for team business operations. The chief operations officer works closely with the president and chief engineer to develop timelines, budgets, and design goals. They are also responsible for coordinating team events, acquiring and managing sponsorships, and maintaining the financial well-being of the team.

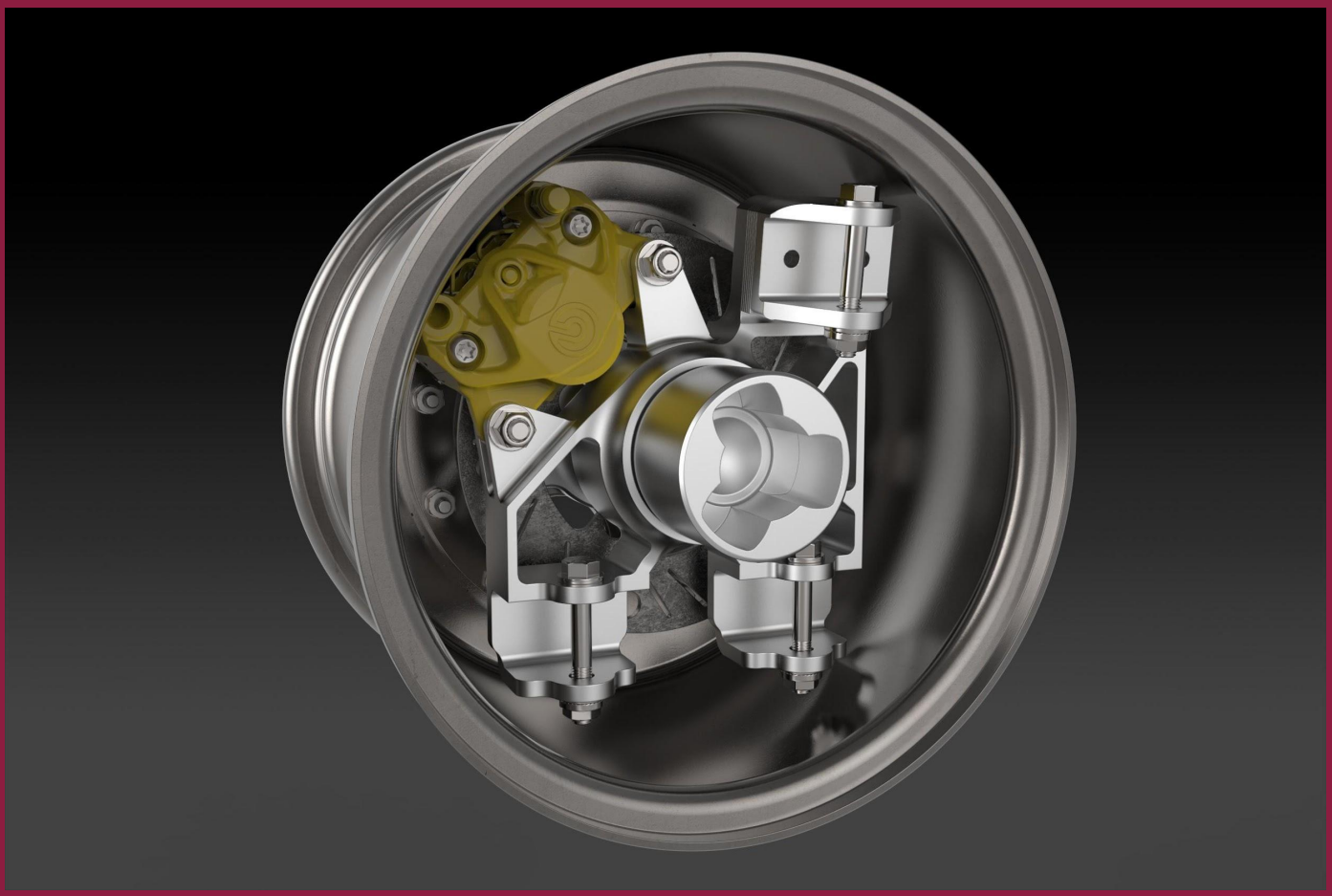
Engineering Sub-Teams

Aerodynamics Team

Responsible for developing designs for every aerodynamic aspect of the car; this includes the body/nose cone, front wing, rear wing, undertray, and side pods. The iterative design process is heavily reliant on Computer Aided Design (CAD) and Computational Fluid Dynamics (CFD). SolidWorks is typically used to design each of the components using a combination of solid modeling and surface modeling. Once designs are finalized, the manufacturing process begins with construction of molds and fixtures. Carbon fiber and aluminum hexcore are used to make the panels and structures into a complete aerodynamic package for the car.

Brakes Team

Responsible for the design and manufacturing of the car's braking system. Members of this team will spend a great deal of time optimizing brake geometry and material properties to more effectively stop the car.



Chassis Team

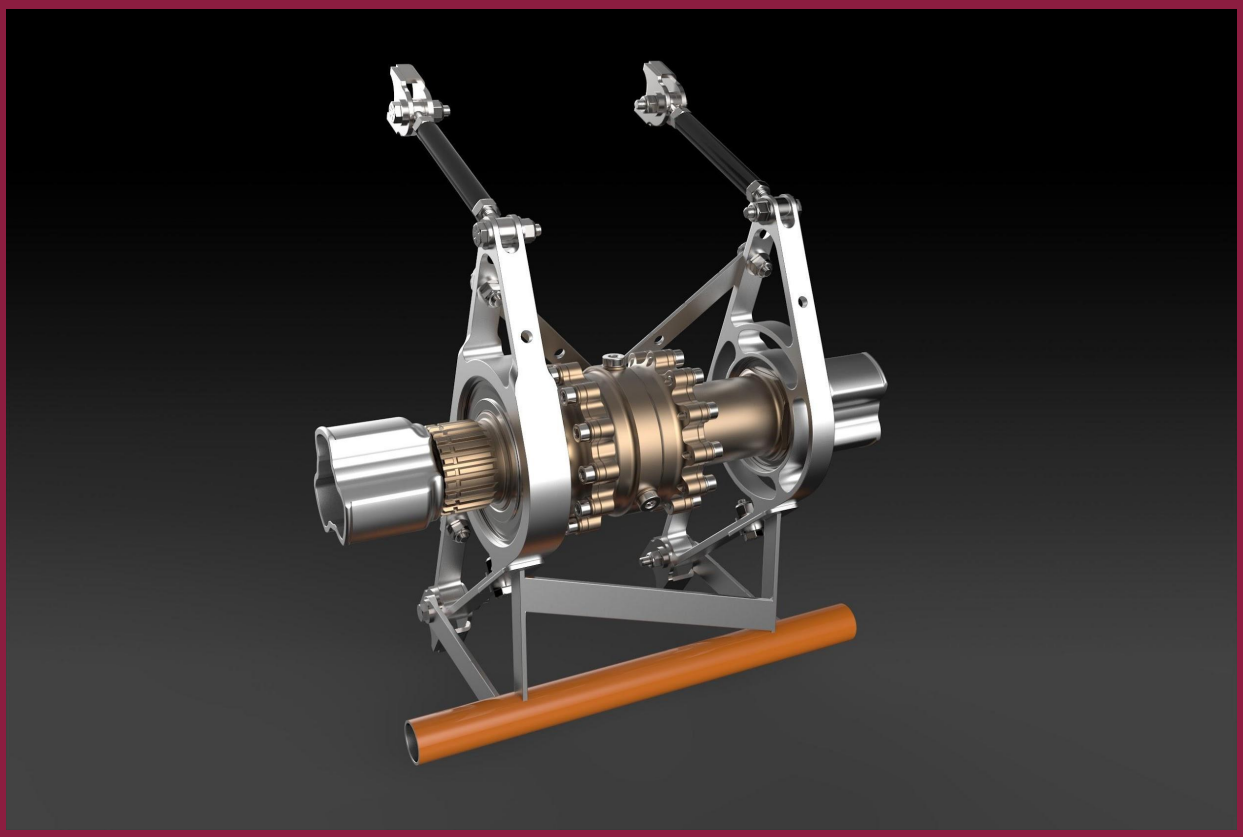
Designs and manufactures the chassis for the car along with manufacturing other components that are welded. This is accomplished by first creating a working model within CAD, performing GD&T, and manufacturing the design out of 4130 AISI Steel. This is a very hands-on team which utilizes skills in metal fabrication such as welding and bending.

Data Acquisition Team

Responsible for the design and implementation of electronic systems specifically tasked with data acquisition. The team acquires data from testing and competition to improve the vehicle performance and spot problem areas.

Drivetrain Team

Responsible for designing and manufacturing all power transmission components between the engine and wheels, including, but not limited to, the chain, sprockets, differential, shafts, cv joints, and wheel hubs. All parts are designed in CAD to ensure clearance and alignment, and FEA is run to confirm adequate strength and allow for iterative lightweighting. Final drive and differential tuning will be applied both by theoretical calculations and vehicle testing.



Engine Team

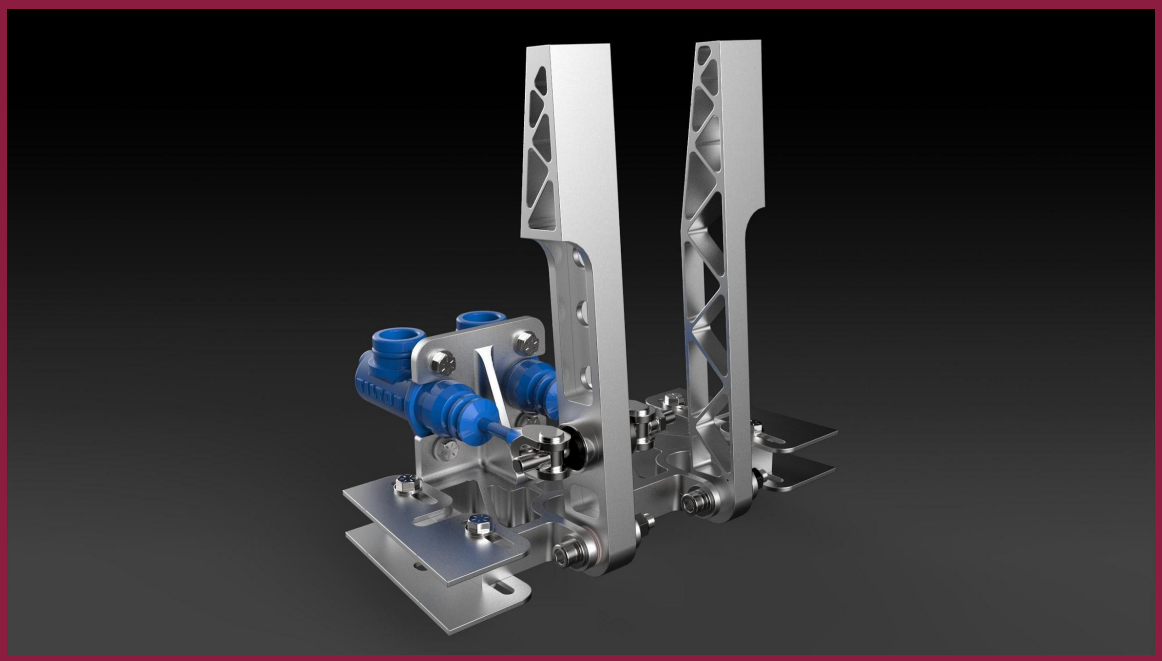
The engine team is responsible for designing, manufacturing, and testing the engine systems in addition to engine selection and implementation. Our design process involves finding a high-performance engine, designing new intake and headers, finding the best muffler for the engine and re-tuning the engine's Engine Control Unit (ECU) to get optimal engine performance. Members can expect to use a great deal of thermodynamics and CAD in this sub-team.

Suspension Team

The suspension team is responsible for designing a suspension system that keeps the tires at their optimal performance at all times which ensures a solid foundation for the race car. As part of this team you will assist in: designing kinematic structures of the suspension, testing and validating suspension components for both strength and proper motion, collecting data from tire temps to camber changes, sorting collected raw data into condensed and useful data, making changes to suspension components in accordance with driver feedback, and last but not least, the manufacturing of the suspension components.

Systems Team

Responsible for all driver interfaces and cockpit enclosure, which includes but is not limited to, the pedals, steering system (rack, column, wheel), shifter, and seat. The systems team must make sure that the drivers fit in the car correctly and make the car as comfortable to use as possible. The systems team must work closely with the other sub-teams to ensure that all driver controls are integrated seamlessly.



Operations Sub-Teams

Sponsorship Team

This team is responsible for working with local and national businesses in order to develop new monetary, material, and contract based sponsorships. Team members also stay in contact with past sponsors to ensure a long lasting and valuable relationship. In addition, Sponsorship will seek leads for fundraising opportunities.

Marcom Team

This team is in charge of all things marketing and communications. This team is composed of designers, journalists, photographers, and videographers who capture our team's work and promote it on our website and social media pages. Additionally, the Marcom Team will play a key role in communications club-wide. Cultivating and establishing a powerful brand will be just one exciting project this year.

Event Planning Team

The Event Planning team is responsible for planning and executing every event hosted by Sun Devil Motorsports, from track days to resume reviews. Our biggest events: testing days, ASU Homecoming, Fundraisers, Socials, Unveil, and competition travel are organized by this team to be the best it can be.

Finance Team

The Finance team allows our whole club to function. Duties include managing the team budget and applying for funding from sources within ASU. Close collaboration with the Sponsorship and Purchasing teams will be paramount.

Purchasing Team

A new addition to the Sun Devil Motorsports club, the Purchasing team is responsible for coordinating with the Finance team and each Engineering subteam to procure the best materials for the lowest prices within the budgeted amount. Members of this team will apply the classroom to the workspace especially in the research and negotiation with suppliers.

Special Projects Team

Like the Purchasing team, the Special Projects team is new this year. All problem-solvers are welcome to support the operations of the club by creating anything from interactive databases to a full on business plan. The Special Projects team will identify and execute needed improvements within the team.

Membership Benefits

- Hands-on experience you won't get anywhere else
  - Get experience **being** an engineer, not experience learning how to be an engineer
- Entrance into our resume pool
- Exposure to recruiters from many different engineering companies (Ford, Tesla, SpaceX, Mathworks, DSS, General Motors, and many more)
- Connections with over 100 other students of various majors
- Opportunity for free tickets to special events when they occur (ex: NASCAR tickets)

Where to Start

1. Fill out the New Member Application google form
2. At the beginning of the semester, sign up and complete subteam interviews
3. You will be invited to be a member on OrgSync if selected for a subteam
4. Sign the SDM23 Member Expectations Contract
5. You will be invited by your sub-team lead to join Slack
    - Turn on notifications for your sub-team chat and announcements channel!
6. Pay dues via Venmo or Zelle
7. Keep an eye out for upcoming team events
8. **Build race car**

We recruit at the beginning of each semester. If you are looking to join later, please fill out the ASU Student Demonstration of Interest form so we can notify you if/when a sub-team position opens.

Membership Expectations

- Attend regularly scheduled team meetings and sub-team meetings
- Take initiative in your education
- Adhere to standards of the ASU Code of Conduct, Sun Devil Motorsports member code of conduct, and Sun Devil Motorsports constitution