

SPONSORSHIP NEWSLETTER

JAN 2021



UCD
FORMULA
STUDENT

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BUSINESS

PETER GATELY

In the Business Team, we like to think of ourselves as the engine that drives UCD Formula Student. While the Mech and Elec teams get stuck into the design and manufacturing of the car, we keep our hands clean, running everything behind the scenes while also acting as the public face of the team.

The team has worked to bring about a significant expansion in this academic year, allowing for the distribution of our members into specific sub-teams of Marketing, Development, Sponsorship, and Finance. From this, we have been able to undertake and plan for many new exciting ventures to educate our members, grow our online presence, and promote interest in STEM through the platform of Formula Student.

Day to day, we can see the personal growth of our members enabled by involvement in Formula Student, and our ambitions for the year continuously grow as a result.

I would like to extend thanks on behalf of the team to our Sponsors and Partners who make all of this possible - your generosity is greatly appreciated. We are excited to keep you updated on how your support helps the team to reach our goals and strive to go beyond.

IF WE ARE THE ENGINE OF UCD FORMULA STUDENT, THEN OUR SPONSORS & PARTNERS ARE THE FUEL.



**PETER
GATELY**
BUSINESS TEAM CAPTAIN



MARKETING TEAM

The Marketing Team have been busy staying on top of their regular duties - maintaining the team's socials. Our content curators manage pieces sent in from our Mech and Elec teams for Mech Monday and Elec Wednesday posts respectively. These segments offer our followers an educational insight into the engineering that goes into the UCDFS build and Formula motorsport.

The content curators also write and prepare content for the other days of the week, with posts such as Tech Tuesday and Women in Motorsport - again, focusing the spotlight on key topics in motorsport.

Some other recent content shared on our socials have been Alumni posts (where graduate students describe their experiences with UCDFS) and Team Bios (to make sure our committed team members are recognised for their hard work). The team have also been updating the UCDFS website to ensure that it is ready in the run-up to the Silverstone competition.

The Marketing Team would like to remind sponsors that if they have materials they would like circulated on our socials, such as graduate/internship opportunities, to please contact UCDFS. Our reach has grown significantly over the past few months and we are one of the central student-led bodies in UCD's engineering community, offering direct engagement with Ireland's top students.

BUSINESS MARKETING



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BRANDING & INNOVATION TEAM

RECRUITMENT, BRANDING, INNOVATION, DEVELOPMENT

The UCDFS Development Team has been working on several new ventures this year. Our Branding and Innovation Officers have been creating quizzes for our social platforms to increase member engagement and awareness surrounding UCDFS and our brand pillars.

The Branding and Innovation Officers have also been writing branding insights for our weekly newsletter to UCDFS members, providing members with an insight into motorsport-related technology, education and sustainability.

Another big project that both the Development and Marketing Teams are excited to announce is our new UCDFS DriveFemale initiative. One of our key objectives this year is to increase female engagement in UCDFS and motorsport. We strongly believe it's our responsibility to make a positive impact on gender diversity in the field. To achieve this, our events officer is busy organising a timeline of workshops and talks with a number of female industry professionals.

The development team has also been focusing on the recruitment and training of first and second year students to create a sustainable recruitment process. Currently, UCDFS is mentoring over thirty students to better equip them to work on the UCDFS Mech and Elec teams next year.

BUSINESS BRANDING & INNOVATION



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MECHANICAL

MATTHEW MCCORMACK

Our Mechanical Team has been working flat out over the last few months. After an anti-climactic summer without a trip to Silverstone, we've been even more motivated to build a better, faster and sustainable car.

I'm incredibly proud of the work my team has achieved so far. Let me take through what each sub-team has been working on since September.

BRAKING

This first part of the autumn semester was spent finishing the pedal box design, further refining the design that had been made during the summer.

We used finite element method topology optimisation to allow the computer to remove as much waste material as possible from our base design, all while keeping the components strong enough to handle our maximum load cases. This resulted in an extremely light but strong pedal box. This design can be constructed from a single steel sheet, using plasma cutting to create the components.

The brake disc design was also further refined, reducing manufacturing costs compared to our previous designs. We are now starting to better calculate dynamic wheel loads, working with the suspension team to start calculating exactly how much force will be going through each of our suspension members during a demanding Formula Student track.



**MATTHEW
MCCORMACK**

MECHANICAL TEAM CAPTAIN



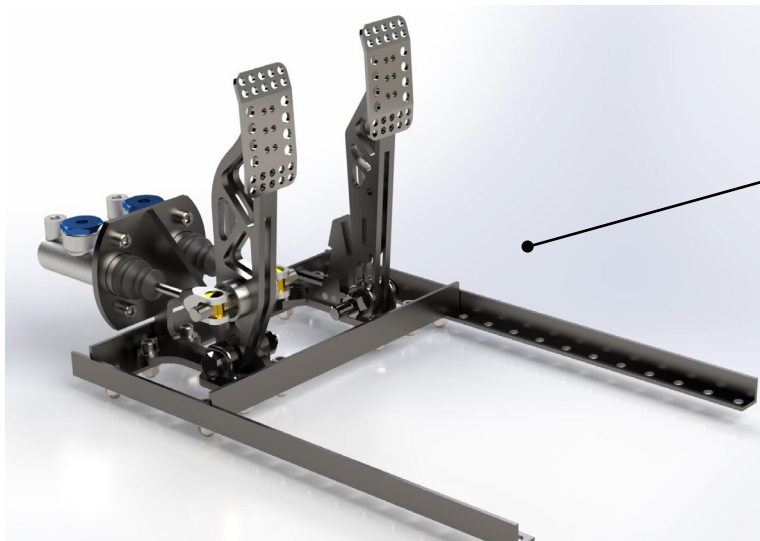
STEERING & SUSPENSION

This semester, the suspension arm geometry was further refined, using Optimum Kinematics. This software allows us to model our suspension movement so we can precisely control our wheel and tyres in a variety of planes and directions.

Combining this with weight transfer calculations, the team can optimise our suspension for the tight, turning twists of the Formula Student sprint and endurance tracks.

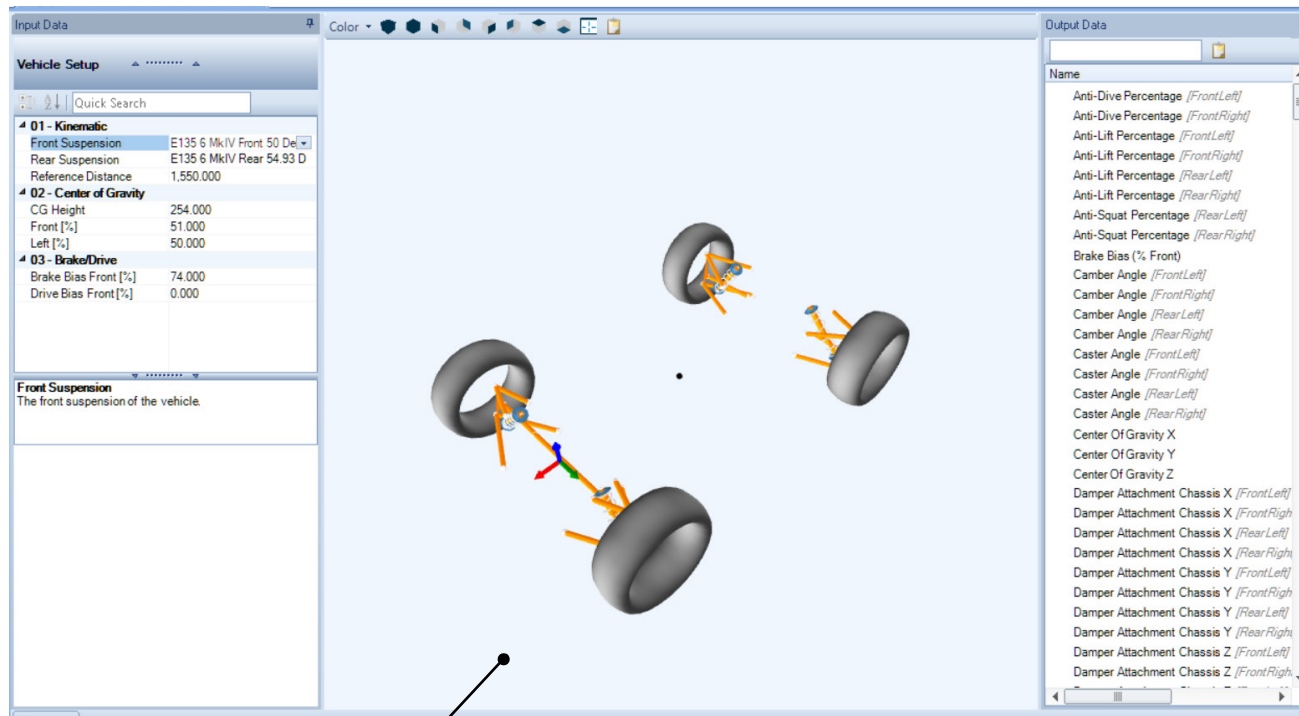
Using this, we can now calculate the forces in each of our suspension members to specify what diameter tubing we need to use. Currently, we are refining the overall design of the components and beginning to make the suspension adaptations needed for this year's car.

We have also been developing the steering system for the car. Using the steering geometry calculation code that we developed in the summer, we are now finalising the dimensions of the steering components. We are also finalising the bevel gearbox that we are using to connect the steering column to the wheel itself.



PEDAL BOX
new and updated

STEERING & SUSPENSION



SUSPENSION

Optimum K visualisation

CHASSIS

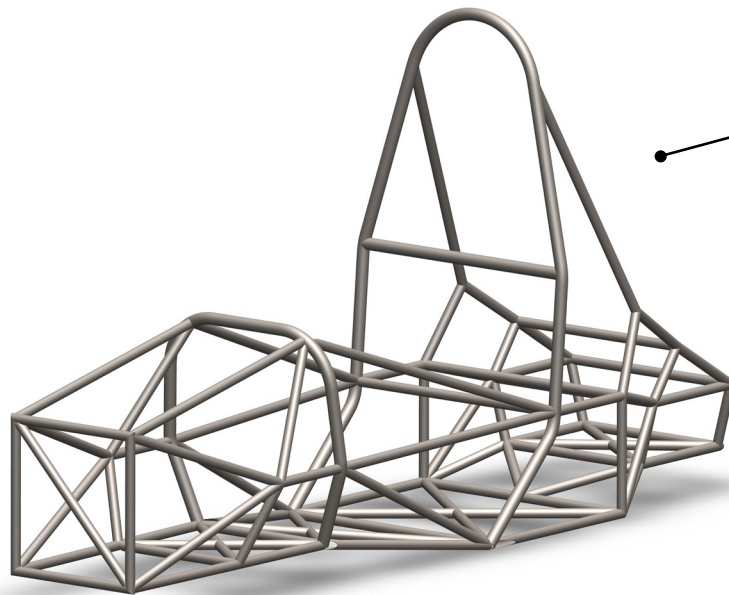
This semester, the chassis has been further refined to accommodate the geometric changes made to the car.

We have worked extensively on the cockpit of the car, ensuring it is perfectly sized for all of our drivers and have begun work on designing our firewalls to ensure adequate fire protection for the drivers.

After conducting an extensive dimensional analysis of the possible drivers, we are currently finalising the seat and all of the safety belts that are required by the Formula Student rulebook.

We have also begun finite element analysis of the chassis, ensuring that it is strong enough to ensure the safety of the driver in the unlikely event of an accident.

As the other teams, both mechanical and electrical, finalise their designs, we will continue to refine the chassis design allowing for the most efficient, light and compact design possible.



CHASSIS
further refined

POWERTRAIN

This semester, we've finalised the drivetrain of the car, including everything to connect the motor to the rear wheels.

We calculated the optimum gear ratio for our car using a sophisticated lap time simulation software, allowing us to optimise our lap times on past Formula Student tracks.

We have also worked extensively on our cooling system, ensuring that the motor, motor controller and any other electronics that need cooling will be adequately cooled during the car's operation.

We will now focus on mounting the differential and motor in the car, making sure both components will stay fixed even with the high torque output of our motor.

MECHANICAL



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ELECTRICAL

EOIN BLEAKLEY

The Electrical Team have been working hard this semester to be as prepared as possible for manufacturing, once we are finally able to get started with the car build.

Creating the initial design of the electrical system of our fully electric Formula Student car in tandem with the mechanical team's design progress takes up a large portion of our work. Despite being prevented from having in-person meetings, we have taken major steps towards our end goal over the past several months.

BATTERY

We learned a lot of things in our first year at Silverstone, and there were many improvements and refinements we were excited to get working on. Most importantly, our new high voltage battery.

Taking inspiration from an Australian solar car team, we came up with an entirely new method that hope will reduce our build time and improve manufacturing quality by repurposing PCB technology. Many drafts and design iterations later, we're nearing the end of the high voltage battery design and are beginning testing on prototypes.

Making a 288-volt battery big enough to power a race car is no easy task and makes up a significant portion of the electrical team's workload. Therefore, we're delighted to be in a great position with it and are excited to begin work on the final manufacturing process in the near future.

The high voltage battery's baby brother the low voltage battery is also near design completion and we are looking forward to ordering parts shortly.



**EOIN
BLEAKLEY**
**ELECTRICAL TEAM
VICE-CAPTAIN**



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WIRE HARNESS

Last semester, EPLAN came onboard as a sponsor and gave access to their wire harness software which offered a lot of new capabilities.

The most exciting aspect was the ability to import our CAD model of the car and make the wire harness in 3D around it. We have been recreating the wire harness in the new software since, with fantastic results.

ENCLOSURES

We recently pivoted our high voltage enclosure design to achieve a joint motor controller and high voltage enclosure block. I won't get into the details of why, but suffice to say, it has made the chassis team very happy! Our high voltage enclosure team have been working hard on CAD to finish the redesign.

The low voltage enclosure design is complete. We are currently waiting for COVID to calm down to give us an opportunity to begin construction.



CLOSING WORD

ROBERT BURKE

It's no doubt that running the project this year has been far more challenging than in previous years. The lack of in-person meetings, workshops and face-to-face onboarding of new recruits has left it challenging to keep the end goal in sight, keep everybody motivated, and feel together as a team.

Despite all of this, UCDFS is in the best shape we have ever been in. The past few months has seen over fifteen new members integrated across all three sub-teams, a Development Team being set up with over thirty members, all working on design challenges that will translate perfectly to the work they will be doing on the team next year, renewed backing from UCD, as well as resources and lab space being made available to us by the UCD Energy Institute.

We have almost hit our funding goal of €36,000, allowing components and raw material orders to be made, and we've grown our treasured relationships with you, our sponsors, our materials suppliers, and manufacturers.

The fact that all of this has been done in the face of a pandemic speaks volumes of the engagement, determination, and ability of our team members, and also to the support and boosts we get from a company deciding that they are going to back us!

In the coming months we hope to build on these relationships, and also to build new ones as we increase our outreach programmes to primary and secondary schools, and spread our following on social media. We hope you enjoy following our journey over the next few months and on the road to Silverstone!



**ROBERT
BURKE**

UCDFS TEAM CAPTAIN



**UCD
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You don't expect to be at the top of the mountain
the day you start climbing.

RON DENNIS, CEO, MCLAREN

