

## From the Team Principal:

We are now coming to the end of our manufacturing stage of the 2016 car and move into what I consider the most exciting part of the project, the development stage. This is where we spend as much time as possible at the track to make our car competition ready before we put it on the plane to Melbourne.

We have faced an endless amount of problems and a hearty congratulations goes to our Electrical team who have put in a lot of work to get this car running. Formula SAE rules are very strict on Electric Vehicles in terms of safety. This means the Electrical teams job becomes a whole lot more complex when compared with an Internal Combustion car but I am confident that we are going to have an amazing car come competition time.

As the year progresses, we are looking forward and planning for the competition. With the car now driving it is going to be a hectic few months getting everything ready and we cannot be more excited.

*Dominic Stulen*



### Sponsor Evening

The sponsor evening in May had a good turn out. The sponsors were able to check out our new facilities and progress on UCM16.



### UC Open Day

UCM15 was displayed at the University to the prospective students who learnt about UCM.



## From our Team Leaders:

### Electrical



Transitioning from an Internal Combustion car in 2015 to an Electric Vehicle (EV) in 2016 is UCM's biggest development ever. The radical differences required to design and build an EV mean our team has been under a huge amount of pressure but we can happily say the car is driving, albeit only in rear wheel drive. The high voltage system has caused a lot of problems but as we solve these, we see the car improving in leaps and bounds with the next step being the four wheel drive system to be implemented in the following weeks, something which should see the 2016 car accelerating like nothing we have had before.

The ergonomics team have been hard at work ensuring that the driver and crew can get the most out of the car. The adjustable pedalbox is complete and adds a level of usability not seen before in UCM. The dash board, seat, steering wheel and headrest are in the car and require only finishing touches before competition.

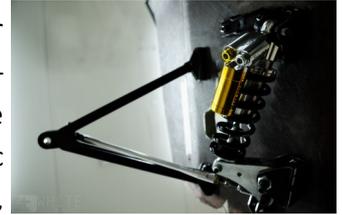
### Ergonomics



## From our Team Leaders:

UCM16 uses an innovative, high load bearing suspension design to accommodate the electric drivetrain. A pull rod configuration, similar to UCM15, has been used to lower the car's centre of mass and keep suspension components out of the over-bonnet air flow. All critical suspension components have now been assembled on the car and are ready for on-track testing. The suspension team are now moving to tune the dynamic performance of the car through installation of anti-roll bars and selection of spring rate, damper, camber and toe settings. A highlight for the suspension team this year has been the successful implementation of carbon fibre/aluminium two piece wheels. In the longer term, UCM aims to continue this innovation by implementing ultra-light-weight full carbon fibre wheels.

### Suspension



### Powertrain



2016 has been a busy year for the powertrain team with a high demand for new and innovative parts to be designed and manufactured. Upon the completion of the testing of the prototype planetary gearboxes, the validated design was manufactured and the complete assemblies are now mounted on the chassis awaiting the on track shake down. Several components of the 2016 powertrain system have been 3D printed, such as the motor cooling sleeves. The redesigned braking system is currently installed in the chassis with the arrival of our new rotors and callipers, completing the powertrain system and readying us for the next phase of testing.

With the CFD modelling of UCM16's aerodynamics package complete the team was able to look to manufacture and complete the first iteration of the wings and endplates. With the design finalized, the team now aims to improve and optimize the current manufacture process to further reduce the weight whilst maintaining a high finish quality. In parallel with the manufacture stage the team has also begun validating the aero package of the car. A pressure tapped wing has been constructed and currently logging pressures in the wind tunnel. Once calibration of the software is complete we will be able to get a real time pressure distribution of the wing through a variety of dynamic situations. These results are then to be compared to that of the ANSYS simulations to validate the aero package.

### Aerodynamics



### Chassis



The chassis team spent a solid 5 weeks manufacturing this year's carbon fibre monocoque chassis. We stuck to an aggressive timeline and can proudly say we pulled it off, with a chassis now sitting in the workshop awaiting the remaining components. We would like to extend a huge thankyou to Rivers Carbon in Auckland for their continued support, we spent two weeks using their workshop space and autoclave to successfully construct our chassis. With the carbon fibre monocoque completed in May, the chassis team has busy manufacturing steel roll hoops, as required by competition rules, as well as accommodating for the mounting of suspension and tractive system components using our innovative resin-injection hard point method. With components mounted and the car ready to drive, the focus of the chassis team will shift to design validation, ensuring rules compliance, as well as investigating possible improvements to be made to next year's chassis iteration