



**Cranfield**  
University

Postgraduate  
master's courses in

# Motorsport Engineering

**Academic year 2024/25 entry**

Advanced Motorsport Engineering MSc  
Advanced Motorsport Mechatronics MSc

# Cranfield University

We are the UK's only specialist postgraduate university in technology and management, with longstanding relationships with some of the most prestigious global companies. Our close collaboration with industry, and passion for the areas we operate in, will help your career.

## Specialist postgraduate

A research-focused professional community

# 88%

of our research is world-leading or internationally excellent

Research Excellence Framework (REF) 2021

## World first

In 2018 Cranfield introduced the Advanced Motorsport Mechatronics MSc, the first master's course covering mechatronics and motorsport.

## Top 30 in the world

for Engineering – Mechanical, Aeronautical and Manufacturing  
QS World University Rankings by subject, 2023

A professional network of  
**75,000+**  
alumni, from  
177 countries

**5,000+**  
postgraduate students  
from **100+ countries**

### Cranfield Impact Centre

is one of just two FIA (Federation Internationale de l'Automobile) approved test centres in the world, crash-testing Formula One cars.

As we are postgraduate only, we are not listed in league tables that help compare undergraduate universities, such as *The Times World Rankings* and *The Complete University Guide*.

"I am entirely grateful to my lecturers and fellow classmates at Cranfield University, for helping me achieve a lifelong dream of working in F1. The taught modules I attended were 100% relevant to the industry, which I think separates Cranfield from other universities. The modules bridged the gap from understanding the fundamentals, to being able to apply the theory to real-life problems that I face in my job. I highly recommend studying at Cranfield, it is a great starting point for your career and you will not regret it."

**Calum Armstrong**, Model Design Engineer, Scuderia AlphaTauri  
(Advanced Motorsport Engineering MSc 2020)



# Reasons to study motorsport with us

## 1 Links with industry

Our courses are developed in collaboration with leading motorsport businesses. Steered and supported by an industrial advisory panel, comprising of senior motorsport professionals, our courses are designed to meet the needs of the international motorsport sector.

## 2 Motorsport pedigree

Cranfield has undertaken research, consultancy and testing for the motorsport sector since the 1970s. This track record ensures our courses are highly respected by the motorsport industry. The Cranfield Impact Centre is a Fédération Internationale de l'Automobile (FIA) approved test centre, and Axsim Racing is at the forefront of race driving simulation. Our MSc programmes are linked to AVL through their University Partnership Scheme, where students have access to AVL Boost software.

## 3 Outstanding facilities

You will have access to Cranfield's extensive facilities which motorsport and high-performance engineering companies have used for many years. Our facilities, including the Multi User Environment for Autonomous Vehicle Innovation (MUEAVI), our purpose-built test track for research into connected and autonomous vehicles, Off-Road Engineering System (ORES), four post test rig, damper dynos, bespoke tyre test rigs, Off Road Dynamics Facility (ORDF) wind tunnels and composites lab, will all support your learning experience across a wide range of practical sessions.

## 4 Career prospects

Our courses prepare you for stimulating and rewarding motorsport and high-performance engineering careers. Our students progress onto careers ranging from design roles to working trackside with teams. On successful completion of our courses you will gain rapid career progression within the motorsport industry.

## 5 Networking opportunities

Cranfield has an enviable network of industry contacts. Many of our alumni come back to provide industrial insight during the lecture programme, and support both the group design projects and individual research projects. In addition, you can join a dedicated Cranfield Motorsport Facebook page and make use of LinkedIn.

## 6 Motorsport-related project work

Cranfield has a enviable network of industry contacts. Many of our alumni come back to provide industrial insight during the lecture programme, and support both the group design projects and individual research projects. In addition, you can join a dedicated Cranfield Motorsport Facebook page and make use of LinkedIn.

# Courses

## Develop your skills and expertise in motorsport and high-performance engineering through a rigorous combination of teaching and motorsport-related project work.

You will learn from academics and industry experts, with modules covering aerodynamics, computational fluid dynamics (CFD), materials technology relating to metallic and composite structures, mechatronics, modelling, control systems and applications, safety of motorsport vehicle structures, powertrain development, vehicle dynamics, simulation, data acquisition and electronics, tyre characterisation and modelling.

Modules form 40% of the course content, with the group and individual projects making up the remaining 60%.

This brochure shows the modules offered in the 2023/2024 academic year, to give you an idea of course content. To keep our courses relevant and up-to-date, modules are subject to change so please check the latest information on our website.

### MSc by Research

This is an intensive research degree that allows you to demonstrate your ability to conduct research, while benefiting from the support of your supervisor. At the end of the course you will submit a thesis that represents a contribution to knowledge, or the application of existing knowledge to new situations. In consultation with your supervisor and course director you can select a number of taught modules which complement your research topic, creating a personalised master's programme.

MSc by Research is available in the following areas:

- Automotive and vehicle engineering,
- Automotive robotics and vehicle mechatronics,
- Connected and autonomous ground based vehicles,
- Motorsport engineering,
- Motorsport mechatronics.

Those who would prefer a more focused and specialist year of study to create a deeper understanding of a particular topic are in great demand throughout the motorsport industry.

Your project can either relate to an existing industrial problem, or novel blue sky thinking. You can also consider doing this course part-time while continuing to work.

Cranfield has recently teamed up with Oracle Red Bull Racing, so some research students may be able to obtain hands-on industrial experience. For more information about our MSc by Research qualification see [www.cranfield.ac.uk/research](http://www.cranfield.ac.uk/research)

### Advanced Motorsport Engineering

MSc

[www.cranfield.ac.uk/motorsport](http://www.cranfield.ac.uk/motorsport) • Accredited – see page 9

Gain a sound understanding of the fundamental scientific, engineering and business principles associated with motorsport, and their implementation within a high-performance technology context. Ideally placed within the UK's motorsport valley, this course covers the design, construction and operation of competition vehicles. You will study aspects of materials science, aerodynamics, computational fluid dynamics (CFD), structural analysis, vehicle systems, vehicle dynamics, data acquisition, electronics and the business of motorsport.

#### Modules

- Motorsport Structural Analysis,
- Motorsport Electronics and Data Acquisition,
- Motorsport Vehicle Dynamics,
- Motorsport Aerodynamics,
- Computational Fluid Dynamics for Motorsport,
- The Business of Motorsport,
- Composite Structures for Motorsport,
- Motorsport Powertrains.

### Advanced Motorsport Mechatronics

MSc

[www.cranfield.ac.uk/motorsportmech](http://www.cranfield.ac.uk/motorsportmech) • Accredited – see page 9

This MSc will provide you with a competitive understanding of the fundamental scientific, engineering, mechatronics and business principles associated with motorsport. Every race car is a collection of mechatronic sub-systems, so you will be fully-skilled to apply for a role in a wide variety of industrial areas. During the course you will study the engineering of advanced control systems, multi-domain computer modelling, in-vehicle communication networks, electromechanical and embedded systems, hardware-in-the-loop validation, and systems integration. This course is ideal for those with an interest in computing and mechanical engineering design.

#### Modules

- Motorsport Electronics and Data Acquisition,
- Motorsport Vehicle Dynamics,
- Vehicle Control Applications,
- The Business of Motorsport,
- Motorsport Powertrains,
- Mechatronics Modelling for Vehicle Systems,
- Advanced Control and Optimisation,
- Embedded Vehicle Control Systems.

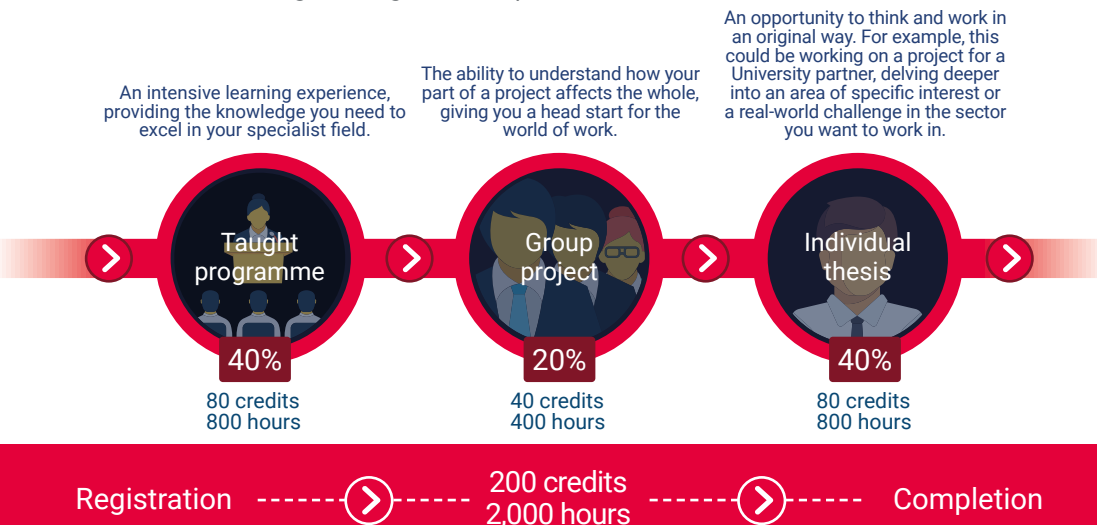


# Course structure

**Our specialist, sector-facing master's courses are set up and developed in close collaboration with industry partners, ensuring the content remains industry-relevant and our graduates' employers see great value with your business-readiness.**

Our MSc, combined with a high-quality undergraduate qualification, will set you apart from a four-year master's programme such as a master's in engineering.

This diagram illustrates the course structure of many of our full-time master's courses, it is not indicative of all courses. Please check your course structure online for more detailed information, including the weight of each phase.



## Motorsport-related group design projects

Cranfield's group project experience provides you with the opportunity to take responsibility for a consultancy-type project while working under academic supervision.

Some recent projects include:

- Conceptual design and performance prediction of a hybrid F2 sidecar,
- Competition vehicle for Electric Dakar, conceptual design and performance prediction,
- Concept designs for a land-speed-record motorcycle,
- Cranfield formula electric series design concepts,
- Green Gulf: low environmental impact competition car to compete in the Gulf States,
- Hybrid hillclimb competition vehicle design: the downhill/uphill racer.

# Industry links

**Cranfield has unrivalled links with motorsport. You will benefit from our extensive contacts and track record of close collaboration with the motorsport sector. These links include our industrial advisory panel and project supporters.**

## Industrial advisory panel

Cranfield University is located in Motorsport Valley®. Our courses are reviewed each year by a panel of industry advisors from leading companies and institutions in the sector. This ensures that the skills you acquire are up-to-date and what employers want. Some of the companies represented on our motorsport industrial advisory panel include:

- Cosworth,
  - Formula 1,
  - Mercedes AMG PETRONAS F1 Motorsport,
  - Prodrive,
  - Red Bull Advanced Technologies,
  - Renault Sport Formula One Team.
- See full list of advisory panel members on the course page on the website.

## Supported projects

The group and individual projects that you will undertake as part of your course are often run in collaboration with our industrial partners.

We have state-of-the-art facilities to help you gain real-life experiences and most of our graduates have a number of job offers before they finish the course.

# Careers

**Our alumni can be found around the world implementing motorsport innovation for competitive advantage.**

Here are some examples of the roles our graduates have gone on to, and the organisations they work for:

## Roles

- Aerodynamicist,
- Design Engineer,
- Performance Engineer,
- Powertrain Control System Engineer (Mechatronics),
- Powertrain Engineer,
- Race/Aero-Performance Engineer,
- Vehicle Simulation Engineer (Mechatronics).

## Organisations

- Alpine,
- Aston Martin F1 Team,
- Envision Virgin Racing Formula E,
- Honda Performance Development,
- Hyundai World Rally Championship,
- McLaren Racing,
- Mercedes-AMG PETRONAS F1,
- NASCAR,
- Red Bull Racing and Red Bull Technology,
- Scuderia Ferrari,
- Virtuosi Racing,
- Yamaha Moto GP Team.

Cranfield University is a member of a select group of universities worldwide, which Ferrari partners with for their F1 Engineering Academy.



# Academic staff

You will be taught by over 20 subject specialists from across the University and industry, who draw on their in-depth research and industrial expertise to provide stimulating and informed input to your learning experience. Here are some of the staff you will be taught by:



**Professor James Brighton**, Head of Cranfield Advanced Vehicle Engineering Centre, Programme Director for Automotive and Motorsport courses  
James has over 25 years' experience working at Cranfield University in the area of automotive and motorsport vehicle engineering. He is currently module lead for Motorsport Vehicle Dynamics and leads a large portfolio of industrial research programmes for vehicle manufacturers worldwide. His motorsport research encompasses vehicle dynamics, tyre dynamics performance simulation and Hardware-in-the-Loop (HiL) and Driver-in-the-Loop (DiL) test rig development.



**Efstathios Siampis**, Lecturer in Advanced Vehicle Engineering Centre  
Efstathios is Admissions Tutor for our Motorsport Mechatronics MSc and specialises in the advanced control of vehicle systems, including suspension and powertrain. He works across the motorsport and automotive sector. His research interests include vehicle systems modelling, autonomous vehicle dynamics, optimal control and estimation and embedded systems.



**Dr Veronica Marchante Rodriguez**, Research Fellow in Thermoplastic Nanocomposites  
Veronica has a PhD in Chemical Engineering and has worked in composites-related research since she joined Cranfield University. She is Admissions Tutor for our Advanced Motorsport Engineering MSc and is module leader for the Composite Structures for Motorsport module.



**Dr Kim Blackburn**, Lecturer and Research Fellow in Vehicle and System Engineering  
Kim is the Course Director for our Motorsport MSc courses. He is a specialist in instrumentation and data acquisition and the design and control of mechatronic systems. He is also active in the area of applied aerodynamic measurements in Formula One and British Touring Car Championship. He also manages our advanced rig test capability used by race teams from around the world.

"The careers service was a great help in all stages of the job application process: preparing and tailoring CVs and cover letters, refining interview technique, and even helping to read through employment offers and contracts."

**James Montgomery**, Graduate Engineer, Integral Powertrain  
(Advanced Motorsport Engineering MSc 2021)



# Key facts and statistics

## Course information



**Full-time**  
One year



**Start date**  
September/October



**MSc**



**Fees**

Please see the individual course pages on our website for full fee information and full-time or part-time options. Terms and conditions apply.

You also have the opportunity to apply for the Fédération Internationale de l'Automobile (FIA) scholarship.

See [www.cranfield.ac.uk/motorsportscholarship](http://www.cranfield.ac.uk/motorsportscholarship)

See [www.cranfield.ac.uk/fees](http://www.cranfield.ac.uk/fees)

## Cohort profile\*



**Geographic spread**  
40% UK  
60% Rest of world



**Typical cohort age**  
24-50



**Average cohort size**  
Advanced Motorsport Engineering: 35  
Advanced Motorsport Mechatronics: 10

\*These figures give an indication of the course make-up at registration across our motorsport courses for the entry year 2022-2023.

## Accreditations

The Advanced Motorsport Engineering MSc and Advanced Motorsport Mechatronics MSc are accredited by the Institute of Engineering and Technology and the Institute of Mechanical Engineers on behalf of the Engineering Council as meeting the requirements for further learning for registration as a Chartered Engineer. The Advanced Motorsport Engineering MSc is also accredited by the Royal Aeronautical Society.

You can check the accreditation status of this or any other degree programme at [www.engc.org.uk/acad](http://www.engc.org.uk/acad) or visit the course webpage for further details.



## More than a degree with the Cranfield Enhance programme

Cranfield graduates are valued for their distinctive skills and capabilities. We have developed these programmes to complement and enhance what you learn on your chosen qualification. On the Cranfield Enhance programme, you will be able to earn 'digital badges' in areas such as Employability, Entrepreneurship, Sustainability and Outreach to showcase your new skills to prospective employers.

Read more at [www.cranfield.ac.uk/enhance](http://www.cranfield.ac.uk/enhance)

## Financing your studies

If you need advice on funding your course or living costs, we can provide information and a range of online tools to help you put together the funding package you need. There is more information on our website: [www.cranfield.ac.uk/funding](http://www.cranfield.ac.uk/funding)

You also have the opportunity to apply for the Fédération Internationale de l'Automobile (FIA) scholarship. See: [www.cranfield.ac.uk/motorsportscholarship](http://www.cranfield.ac.uk/motorsportscholarship)

## How to apply

Read more about our entry requirements and how to apply: [www.cranfield.ac.uk/apply](http://www.cranfield.ac.uk/apply)



# Life at Cranfield

A welcoming, professional campus community.

Located just over an hour from London in the English countryside, Cranfield's campus environment supports close, working relationships between our multinational postgraduate students and academic and industry experts.

[www.cranfield.ac.uk/visit](http://www.cranfield.ac.uk/visit)



Have a look at some of our facilities in this virtual experience.

[virtualexperience.cranfield.ac.uk](http://virtualexperience.cranfield.ac.uk)

Cranfield University works with over

**1,500** businesses and governments  
based in over 40 countries

These organisations include:

**Arplus<sup>+</sup>**  
**IDIADA**

**BB** BALANCE  
BATTERIES

**COSWORTH**

**PUNCH** | Flybrid  
ENERGY STORED, POWER DELIVERED

**UTAC**

For a full list of Cranfield courses, please see our prospectus and website.

[www.cranfield.ac.uk/transportsystems](http://www.cranfield.ac.uk/transportsystems)

Cranfield University  
Cranfield  
MK43 0AL, UK

T: +44 (0)1234 758083  
E: [studytransport@cranfield.ac.uk](mailto:studytransport@cranfield.ac.uk)



@cranfielduni



Cranfield University



@cranfielduni



/cranfielduni



/cranfielduni



[blogs.cranfield.ac.uk](https://blogs.cranfield.ac.uk)

Every effort is made to ensure that the information in this brochure is correct at the time it is printed. Please check our website for the latest information.

SATM-AME-September 2023.