



Postgraduate
master's courses in

Automotive engineering and technology

Academic year 2021/22 entry

Automotive Engineering MSc

Automotive Mechatronics MSc

Connected and Autonomous Vehicle Engineering (Automotive) MSc

Cranfield University

We are the UK's only specialist postgraduate university in technology and management, with long-standing 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

81%

of our research is world-leading or internationally excellent

Research Excellence Framework (REF) 2014



THE QUEEN'S ANNIVERSARY PRIZES FOR HIGHER AND FURTHER EDUCATION 2019

Over **£100 million** of investment in new facilities over the past four years

Six-time winner of the Queen's Anniversary Prize for Higher and Further Education

A professional network of **67,000+** alumni, from 169 countries

UK no.2 graduate employment

DLHE longitudinal, 2017

UK Top 5 for Engineering (Mechanical, Aeronautical and Manufacturing)
QS World University Rankings by subject, 2020

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*.

"From living locally to Cranfield I was aware of its reputation with industry, but what sold it to me was the positive recommendations from previous alumni who I spoke to on a year in industry. I have since been fortunate enough to have secured a place on the Software & Controls Graduate Scheme at Mercedes AMG HPP, with my first rotation in the Formula 1 Controls team."

Jason Davies, current student,
(Automotive Mechatronics MSc)



Reasons to study **automotive engineering and technology** with us

1 Industry links

You will have regular contact with industry through group and individual project work as well as guest lectures from partner organisations. Courses are regularly reviewed by an industrial advisory panel of leading professionals from industry such as Ford, to ensure the content is relevant and meets the expectations of employers.

2 Heritage

Our Automotive Engineering MSc course is one of our longest-running academic programmes, and we have a strong track record in the automotive sector. Lotus's first active suspension system was designed here. We are currently supporting the development of connected and autonomous vehicles.

3 Learning environment

We offer a mature and focused learning environment, with an international student body and a global reputation. We bring together talented students and academics.

4 Outstanding facilities

At our Advanced Vehicle Engineering Centre students have access to globally unique labs and test facilities including our Off-road Vehicle Dynamics facility and the Cranfield Impact Centre. Our Intelligent Mobility Engineering Centre (IMEC) is fully-equipped for the development and testing of driverless road vehicles.

5 Networking opportunities

Our close and long-established links with the automotive industry ensure that you will have opportunities to meet and develop contacts with senior automotive engineers from automotive companies, including manufacturers, suppliers and dynamic small- and medium-sized business enterprises.

6 Funding opportunities

You may be eligible for the bursaries and scholarships that are available, such as the IMechE Scholarship, to help support your development.



Multi User Environment for Autonomous Vehicle Innovation.



Off-road Environment Simulation facility.

Automotive engineering and technology courses

Established for over 60 years, we have excellent industrial links and an outstanding record for the employment of our graduates. Our courses have been developed to provide the industry with high-calibre engineers that are equipped with the necessary skills to advance vehicle technology to meet the demands of the future.

Cranfield graduates are some of the most desirable in the world for automotive companies. You will be taught by leading academics as well as industrial practitioners, and work alongside a strong research team at Cranfield University.

Automotive Engineering (Accredited – see page 9)

MSc

This course will enable you to develop a broad range of skills and expertise across the automotive spectrum, including engine design, hybrid and electric vehicles, chassis and braking systems. Directed by an industrial advisory panel of senior automotive engineers, this course is suitable if you have an engineering, physics or mathematics undergraduate degree and are seeking a career designing and developing the automotive systems, technologies and components of the future.

You will carry out research into a current automotive challenge, participate in a group design project and complete a research thesis project.

Automotive Mechatronics (Accredited – see page 9)

MSc

This course has been developed to respond to the increasing industry demand for engineers with skills to deliver multidisciplinary integration of physical systems with electronic digital controls. This field is responsible for many recent and exciting advances in the automotive sector.

Suitable for those with an engineering, mathematics or applied science undergraduate degree, this course will help you to develop a skill set combining electrical, mechanical, control systems and physical system modelling.

The demand for these skills means that you will emerge with the ability to apply the principles and practice of automotive mechatronics in businesses worldwide and enjoy swift career progression.

Connected and Autonomous Vehicle Engineering (Automotive)

MSc

The automotive sector is changing. Car manufacturers and technology companies are rapidly developing new autonomous technologies that will redefine the future of transport. With the rapid adoption of smart vehicle functions, industry requires a unique set of skills from the engineers and programmers developing them.

The course will develop your technical and transferable skills in autonomous navigation, sensing and perception, systems integration, human factors, and ethical/legal frameworks, to prepare you for a career within the automotive sector.

Modules form 40% of the course content, the group project is 20% and the individual project is 40%.

This brochure shows the compulsory and (where applicable) some elective modules offered in the 2020-2021 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.

All of these courses are full-time.

Modules:	Automotive Engineering	Automotive Mechatronics	Connected and Autonomous Vehicle Engineering (Automotive)
Advanced Control and Optimisation		✓	
Automotive Control and Simulation	✓	✓	
Automotive Engineering Induction	✓		
Automotive Mechatronics Induction		✓	
Embedded Vehicle Control Systems		✓	✓
Engine Design and Performance	✓		
Mechatronic Modelling for Vehicle Systems		✓	
Vehicle Control Applications		✓	
Vehicle Design Powertrain and Performance	✓		
Vehicle Dynamics	✓	✓	
Vehicle Electrification and Hybridisation	✓	✓	
Automotive Structures	✓		
Automotive Manufacturing	✓		
Ethics, Safety and Regulation			✓
Vehicle Powertrain and Performance			✓
Human Factors, Human-Computer Interaction and Advanced Driver Assistance Systems (ADAS)			✓
Networked Systems and Cybersecurity			✓
Path Planning, Autonomy and Decision Making			✓
Sensors, Perception and Visualisation			✓
Systems Engineering			✓
Technology Strategy and Business Models			✓
Transport System Optimisation			✓

MSc by Research

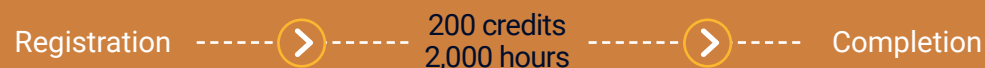
An intensive research degree that allows you to demonstrate your ability to conduct research, while benefiting from the support of your supervisor. At the end of the course you will submit a thesis that represents a contribution to knowledge, or the application of existing knowledge to new situations.

Learn more about our Master's by Research qualification:
www.cranfield.ac.uk/research

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 employers are impressed with your business-readiness.

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 and part-time course structure variations.



Industry-sponsored group projects

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

Recent projects include:

- Design of a low emission UK ambulance that featured an active suspension and active ride patient table, electric powertrain, regenerative braking and weight reduction of one tonne.
- Autonomous smart parking technology for the Transport Systems Catapult driverless 'pod' vehicle.
- Design of an electric parking/auxiliary brake actuator for commercial vehicles.

Industry links

Cranfield has unrivalled links with industry. You will benefit from our extensive contacts and track record of close collaboration with the automotive sector. These links include industrial advisory panels and project sponsors.

Industrial advisory panel

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 automotive engineering and technology programme industrial advisory panel include:



Project sponsors

The group and individual projects that you will take as part of your course are often run in collaboration with our industrial partners. More information about group projects can be seen opposite and some of our partners are shown on the back cover of this brochure.

Careers

Our alumni can be found around the world implementing automotive engineering and technology innovation for business success.

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

Roles:

- Application Engineer,
- Autonomous systems engineer,
- Development Engineer,
- Electric Vehicle/Plug-in Hybrid Electric Vehicle Charging System Engineer,
- International Graduate Consultant,
- Performance Engineer,
- Powertrain Design Engineer,
- Project Engineer,
- Test Engineer.

Organisations:

- Aston Martin,
- IPG Automotive GmbH,
- McLaren,
- Nissan,
- Porsche,
- Renault,
- Ricardo,
- RML Group,
- Tata Technologies,
- Titan Automotive,
- Toyota Motor Europe,
- TVS Motor Company.

Academic staff

You will be taught by a wide range of subject specialists from the University and industry professionals who draw on their 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

James has over 25 years' experience relating to off-road vehicle dynamics, terra-mechanics, tyre and track system modelling, advanced vehicle instrumentation and lightweight material structures. Through the Off-road Dynamics facility his team is able to offer a wide range of vehicle related technical solutions from fundamental research to product design and prototype vehicle sub-system manufacture, supply, evaluation and testing across a wide range of industry sectors.



Dr Daniel Auger, Course Director, Connected and Autonomous Vehicle Engineering (Automotive) MSc

Daniel's research covers applications of control in vehicle electrification and intelligent mobility. He has major projects in lightweight batteries and self-driving car safety. He previously held senior control engineering roles in industry. Daniel has published over 40 research papers, holds MEng and PhD degrees from the University of Cambridge, and is a chartered engineer.



Dr Efstathios Velenis, Course Director, Automotive Mechatronics MSc

Efstathios' research work is focused on vehicle dynamics modelling and control, including active chassis control system development and motion planning and control for automated vehicles. His research has been funded from UK research councils, the European Commission and directly from the industry. He has co-authored over 70 peer-reviewed journal and international conference papers. He is an associate editor of the IEEE Transactions on Vehicular Technology journal.



Dr Glenn Sherwood, Course Director, Automotive Engineering MSc

Glenn lectures in powertrain systems. His research interests are in the development of novel engine designs for high efficiency and low emissions and in novel fuelling strategies for the replacement or part replacement of current automotive fuels. These investigations are aided by laser diagnostics to measure a range of fundamental combustion phenomena.

"As part of my MSc Thesis, I've been able to collaborate with Aston Martin engineers in conjunction with Aston Martin Lagonda located at the Silverstone Circuit. Cranfield inspired me to design the technological solutions of tomorrow that will make a difference. Cranfield undoubtedly gave me the right technical knowledge to start my professional career. There is a real international community at Cranfield with people coming from everywhere around the world."

Franck Paolillo, Analysis Performance Engineer, Michelin Motorsport, (Automotive Engineering MSc 2019)



Key facts and statistics

Course information



Full-time
One year



Start date
September



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.

See www.cranfield.ac.uk/fee-information

Cohort profile*



Geographic spread

40% EU and UK
60% Rest of world



Typical cohort age

20-30 years



Average cohort size

Automotive Engineering: 40
Automotive Mechatronics: 20
(Note that some classes are combined, so may total 60)

* These figures give an indication of the course make-up at registration across our automotive courses for the entry year 2019-2020.

Accreditations

The Automotive Engineering MSc and Automotive Mechatronics MSc is accredited by the Institute of Mechanical Engineers on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer. Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements. You can check the accreditation status of this, or any other degree programme, at www.engc.org.uk/acad or visit the course webpage for further details.



Financing your studies

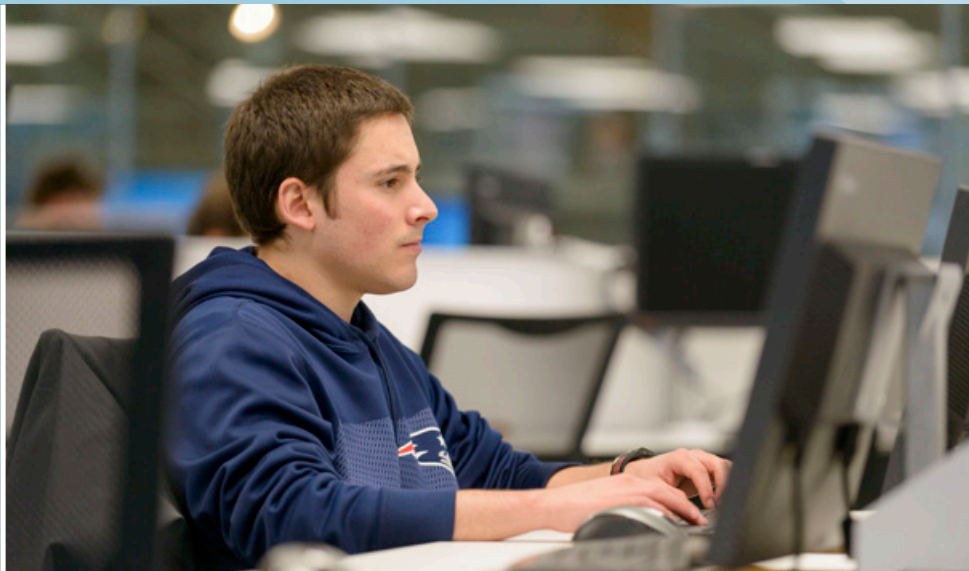
If you need advice on funding your course, we can provide information and a range of online tools to help you put together the funding package you need for your course and living costs.

There is more information on our website:
www.cranfield.ac.uk/funding

How to apply

Read more about our entry requirements and how to apply.

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



Take a virtual tour of our Cranfield campus to see inside some of our facilities.

virtualltour.cranfield.ac.uk

Cranfield University works with over

1,500 businesses and governments
based in over 40 countries

These organisations include:



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

www.cranfield.ac.uk/transportsystems

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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. Some photographs in this publication were taken prior to the 2020 pandemic. Cranfield University follows the latest Government guidelines on social distancing and use of personal protective equipment (PPE). [SATM-AE-September 2020](#).