AUTOMOTIVE, MECHANICAL, MOTORSPORT ENGINEERING AND RACING ENGINE DESIGN

Postgraduate courses
Welcome

The Department of Mechanical Engineering and Mathematical Sciences provides professionally accredited mechanical, automotive and motorsport programmes of study. We focus on providing world-class teaching and applied research whilst giving our students an outstanding experience.

The department is a major international centre for research. To transfer our research and knowledge to the real world we combine fundamental science and market intelligence, creating sustainable technologies and solutions. These seek to minimise environmental impact and deliver economic performance. They also feed back into our research-led teaching and our excellent track record in working with research councils and organisations such as BMW. Our partnerships with business and industry are invaluable.

Our Oxfordshire location puts us at the centre of the ‘hub’ for clean automotive and related industries, enhancing the work we do.

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Courses are developed in conjunction with industry and are designed to ensure that students graduate with the skills and knowledge they need to excel in their chosen careers.

We have a very active research community that is organised into three cross-cutting, inter-disciplinary themes: Sustainable Engineering and Innovation (SEI); Advanced Engines, Propulsion and Vehicles (AEPV); and Simulation, Modelling and Systems Integration (SMSI).

Oxfordshire is home to many high technology companies with Harwell Campus nearby, a home for world leading science, technology and business. Oxford is right in the heart of the UK’s motorsport industry, often called ‘Motorsport Valley’. In total, the area has over 4,000 high performance engineering businesses which make us one of the best locations to pursue your passion in engineering, technology and mathematical sciences.

Professor Gareth Neighbour
Head of the Department of Mechanical Engineering and Mathematical Sciences
Industry standard facilities

We have excellent experimental and computational facilities to conduct advanced research supporting our teaching. Our students have access to laboratories for their coursework and projects, which include the following areas:

**Engine test cells**
We have four engine test cells with state-of-the-art instrumentation used in the development of engines. The facilities are comparable to those available at major vehicle manufacturers.

**Automotive**
There are dedicated areas for Formula Student and the four-post rig for analysing the vehicle dynamics. We have a number of vehicles (for example BAR Formula 1 race car, Formula Renault, BMW MINI and 1 Series and a F1 Force India car) used both for research and teaching.

**Dynamics**
A dedicated area for dynamic characterisation of vibrating structures and noise reduction.

**Fluids lab**
The equipment located in this area enables students to gain deeper understanding of internal and external flows through the use of equipment such as the small-scale wind tunnel with a dedicated data acquisition system, centrifugal pump performance test rig, 2 x flow benches, laminar and turbulent flow rig and forced convection equipment.

**Mechanical testing and stress**
This area houses multi-functional equipment used in teaching, research, contract testing and consultancy. We have experimental facilities to conduct fatigue and impact tests and an in-house heat treatment facility.

**Joining technology**
For over 40 years, Oxford Brookes has been involved in the research and development of various joining technologies. More recently, with the increasing demand for lighter and more efficient structures, we have been engaged with the science and engineering of adhesives, sealants and bonding technology.

The department employs a range of advanced engineering software for postgraduates to use, including:

- A collection of industry standard CAD packages.
- Stress and dynamics analysis packages.
- Computational Fluid Dynamics and Engine simulation software.
- Specialised vehicle performance simulation software.

Students have the chance to develop the skills needed to apply these packages creatively to produce designs customers want.
Industry collaboration and live projects in postgraduate study

Oxford Brookes University has a rich history of providing high quality accredited courses. For over 20 years we have run engineering courses and we are the only university to offer a course in Racing Engine Design.

Our graduates enjoy excellent employment opportunities. Many go on to pursue successful careers with leading engineering and technology companies from major automotive to motorsport companies, including Formula 1 teams and suppliers. Our connections provide students with the opportunity to take charge on ground-breaking projects that can lead to them gaining employment once they graduate.

Our industry connections are constantly growing and we are approached frequently by companies who specifically request our students to work with their teams on a wide range of projects.

In the area of motorsport we have lecturers who have designed and worked on winning Formula 1 race cars. We were chosen by Fernando Alonso and the Cajastur bank to host their motorsport MSc scholarships.

One of our international collaborations within the Automotive industry is with the R&D department of MAN in Germany. MSc student Joao Cesar has completed his capstone project in Munich, in the field of traffic modelling: traffic parameters such as density, flow and speed are used to develop a local traffic estimator, which informs decisions of the MAN adaptive cruise control system. Local traffic estimator uses on-board radar and video fusion to calculate traffic parameters which can be used to observe different traffic states of each lane. This is a very exciting project aimed not only to reduce fuel consumption but also improve road safety.

Dallara
This is a four-year project to design an electric race car. Students have designed all the aspects of the car from the battery pack to the powertrain. This design is going to be marketed and sold to the industry.

MSc students spent the first year of the project researching the most suitable parts for the vehicle, completing an initial prototype. The project is currently in its third year, with students researching the following areas of development: battery design, powertrain design, aerodynamics and cooling system, suspension kinematics and dynamics, vehicle modelling and simulation.

Please see page 25 for more information on this project.

Speedway
An exciting collaboration working with IMo, who run Speedway, research staff and students are looking at various aspects of the series. The collaboration draws on our unique knowledge and includes designing an improved bike frame, increasing Speedway’s popularity in the UK and electric bike design. This collaboration shows our commitment to working with all levels of industry and our drive to affect real change in motorsport.

YASA Motors
Oxford Brookes has worked with YASA for a number years and the latest project is addressing the challenge of motor cooling. The aim is to find a solution which will cool the motor more efficiently as well as reducing the amount of material and the cost of ownership.

BMW
Oxford Brookes worked with BMW as an academic partner on the successful MINI E project. The results of this study can be found on our website (http://mems.brookes.ac.uk/research/sei/emobility.html). Our success on this project has given our students opportunities to secure positions at BMW’s MINI plant in Oxford. Our location at the heart of Motorsport Valley means we work closely with local companies on a variety of projects.
What our students think of our postgraduate courses

Carles Martinez
MSc Motorsport Engineering
Brookes doesn’t guarantee you will get your dream job in F1, but it will provide the main tools and knowledge required. I knew I was going to do my MSc at Brookes when I was given a leaflet about the partnership between a Spanish company, (which was sponsoring Fernando Alonso) and Brookes on my first day at University in Barcelona.

Ana Sanchez
MSc Motorsport Engineering
Oxford Brookes has a reputation as one of the best institutions for Motorsport Engineering, not only in the UK, but world-wide. Professionally, there are opportunities to network at industrial lectures and personally, working in a multi-cultural environment allowed me to understand other ways of finding answers to a problem.

Gabriel Elias
MSc Racing Engine Design
You don’t just walk into F1, you need to be good in your studies, have tons of practical experience and really be the cream of the crop. Brookes alumni give you advice to go for your dream job. My best moment so far, is seeing the 2015 car dominate the start of the season knowing I have designed and worked on parts of the car.

Rohan Shankar
MSc Automotive Engineering
The level of detail of the modules, the quality of professors and facilities; as well as being pushed to the limit with difficult course work has made my time at Brookes a fantastic experience.

Matteo Cucchi
MSc Racing Engine Design
The classes are infused with hands-on experience and my final project exposed me to cutting-edge research in engine design which has been published in key journals.

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MSc Motorsport Engineering
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Cole Pearson
MSc Motorsport Engineering
The Oxford Brookes MSc programme has a strong reputation and great connections with F1 teams. The experience gave me great topics to discuss at interviews and led to my current job at Scuderia Ferrari F1 team.

Student profile
Joana Pereira Fidalgo de Freitas
I first finished my degree in Automotive Engineering back in Portugal and was looking to enrol on an MSc abroad. At the time I had some friends who were just finishing their studies at Brookes and they gave me really good references on the teaching quality and how passionate the professors were about their lectures, so I looked into it. The fact that Oxford is right in the middle of the Motorsport Valley and that Brookes has such good connection to both the motorsport and the manufacturing industry also played a very important role.

One of the things I liked at Brookes was how flexible the MSc was and how you could tailor it to meet your expectations. Towards the end of the MSc I decided I would like to invest some time working with engines, even though most of my modules covered vehicle dynamics topics. So, for my dissertation I ended up picking an engine-related topic that gave me really valuable insight. Even though this was not my area of expertise, I always had the help and support of my mentor on all my questions and it definitely gave me a head start for the job I am in now.

Another really enjoyable experience was being part of the OBR Formula Student team. Being part of FS gives you the opportunity to take your skills from the theory to the real world and in the end you actually get to build an amazing car to show it. There were a lot of sleepless nights and hard work, but seeing how dedicated everyone was and how we overcame so many challenges together as a team was really inspiring and taught me a lot about working together with people. I’ve made amazing friends there that I’m sure I’ll keep for life.

I’m currently working at the MINI Plant as the Diesel Quality Specialist, integrated in the Powertrain Validation and Integration team. We are responsible for testing and validating pre-series vehicles on road and on track concerning engine topics and are also responsible for complex analysis for series vehicles issues. It’s a really interesting role as it means I don’t spend all my time sitting at my desk but also get the chance to do some hands-on work in the workshop or go to the Millbrook Proving Ground and test the cars.
Automotive Engineering MSc
This course provides an opportunity for in-depth study of the engineering principles that enable and drive the automotive industry.

Brookes has a long history of providing high-quality, accredited automotive, motorsport and mechanical engineering courses. These are taught by staff with exceptional knowledge and expertise in their fields. We have, for example, lecturers who are leading the world in research on sustainable vehicle engineering or who have designed and worked on winning F1 race cars.

Why choose this course?
We have close links with industry through research projects and consultancies. Our partners include the BMW MINI plant in Oxford and other local businesses. As well as the traditional aspects of motor car design and manufacture, we have lively and well-funded research programmes in areas of current concern such as vehicle end-of-life issues, and modern composite materials. We also have a growing involvement in electric vehicles.

Course details
To qualify for a master’s degree you must take the compulsory modules, two optional modules and the dissertation.

Dissertations
These are individual research and development projects on a topic of your choice. These projects can be undertaken as part of a wider research project or within collaboration with an industrial partner.

Careers
Our graduates enjoy the very best employment opportunities, with hundreds of engineering students having gone onto successful careers in their chosen industry. Many of our students go on to work with leading automotive or motorsport companies in the UK and worldwide. Our graduates go onto work for Jaguar Land Rover, BMW and their supply chain partners.

You must take three compulsory modules – at least one alternative-compulsory module and two optional modules.

Compulsory modules
■ Advanced Vehicle Dynamics
■ Sustainable Engineering Technology
■ Advanced Engineering Management
■ Dissertation

Alternative-compulsory modules (you must take at least one of these):
■ Noise, Vibration and Harshness
■ Vehicle Crash Engineering

Optional modules (you take one of these, unless you take both alternative-compulsory modules above):
■ Advanced Vehicle Aerodynamics
■ Engineering Reliability and Risk Management
■ CAD/CAM
■ Advanced Powertrain Engineering

Student profile
Rohan Shankar
The primary factors for choosing Brookes were the course content, reputation and motorsport focus. The course was a fantastic experience thanks to the level of detail of the modules and the quality of professors and facilities.

Since leaving Brookes, I completed an industrial placement with MCOM – Motorsport Management in India. I had a role in the TATA T1 Truck Racing Championship to manage the technical race operations under the Secretary of the Race. This involved managing administrative tasks, scrutineering of the trucks, and various other tasks.

You can find more information about this course at mems.brookes.ac.uk/postgraduate.
Mechanical Engineering MSc

The main aims of the MSc in Mechanical Engineering are to introduce you to research, development and practice in advanced engineering design and equip you for professional practice at senior positions of responsibility.

Great engineering design turns great ideas into great products. Our MSc in Mechanical Engineering will give you the skills you need to achieve this. Developing the skills to take complex products all the way from idea to fully validated designs, you will use the most advanced CAD packages and learn the techniques required to analyse your work, testing designs in virtual reality to see how they perform and how reliable they are.

Why choose this course? Mechanical Engineering has been taught at Brookes for over 20 years. You will learn from staff who are experts in their field and bring a variety of knowledge; from physicists, vehicle dynamicists to design engineers. The department has a

Joining Technology Research group, who have been working with industry for over 40 years on developing technologies in this area.

We collaborate with industry in a wide range of key issues; such as sustainability, developing new technologies and innovative ideas. An example of this work is the bamboo bike project, which was an academic’s idea that students wanted to be involved with and they were able to take the project forward in a successful way. Recently staff and students have collaborated with the Bamboo Bicycle Club on the manufacturing process of a bamboo bike. In two days they built a bespoke bamboo bike at the Design Museum in London. Using 3D printing technology to make the lugs (connecting pieces) and bamboo, this project showed how the department is pioneering the manufacturing process of bicycles, the future of which could lead you to being able to build your own bike at home.

Course details
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Dissertations
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Careers
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all the modules you need to succeed, such as the advanced engineering design, CAD/CAM, solidworks and other advanced engineering design software.

The tutors are very helpful, always available and willing to help even if the question isn’t about their module. After exams the feedback is always constructive and clear, if I wanted to rate the tutors I would give them ten-out-of-ten.

The highlight of studying at Brookes is the group course work, these projects are like working in a small company or with team mates. Team work promotes team spirit as well as the opportunity to work with other students who bring different ideas and dynamics to the work. We have access to all journals, computers and software that we need for our course. There is never any problem in getting access to a computer or equipment. We have a well stocked library with the best authors and books.

After completing my course I want to get a position in a design department in the automotive industry alongside studying for my PhD, hopefully at Brookes.

The knowledge that I have gained from studying at Brookes has been helpful when I have applied for and gone for interviews. This knowledge means that I can apply for good design positions because I have the design experience and training from my course.

If you want to get into design this is the course for you. The course also includes other key modules such as business management which is a key skill to have in industry. However, be prepared to work hard to get the experience and knowledge needed to go into industry.

Wheatley is a great community with good facilities like the library and canteen. Our main campus is also amazing with excellent facilities.

Compulsory modules:
- Advanced Mechanical Engineering Design
- Advanced Strength of Components
- Advanced Engineering Management
- Dissertation

Optional modules:
- Computation and Modelling
- CAD/CAM
- Advanced Materials Engineering and Joining Technology
- Sustainable Engineering Technology
- Noise, Vibration and Harshness
- Vehicle Crash Engineering
- Engineering Reliability and Risk Management

Outcomes to work on innovative projects such as the bamboo bike

Academic knowledge in a variety of areas including materials

Industry led research projects

Student profile

Priya Nilayapalem

I chose Brookes because it is the best in mechanical, automotive and racing engineering. The mechanical engineering course concentrates on advanced design concept, which I was interested in focusing on; this made Brookes the best choice for me.

I feel that I have learnt more about design at Brookes than I would have at any other institution and the advanced design module is my favourite module. The course covers the knowledge that I have gained from studying at Brookes has been helpful when I have applied for and gone for interviews. This knowledge means that I can apply for good design positions because I have the design experience and training from my course.

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Wheatley is a great community with good facilities like the library and canteen. Our main campus is also amazing with excellent facilities.
Motorsport Engineering MSc

The MSc in Motorsport Engineering course offered by Oxford Brookes provides the opportunity for you to specialise in areas such as engine technology, chassis performance, racing engineering, management, materials, simulation and data analysis.

Our motorsport and automotive engineering courses are taught by staff with exceptional knowledge and expertise in their fields. We have, for example, lecturers who have designed and worked on winning F1 race cars or who are leading the world in research on sustainable vehicle engineering.

Why choose this course?

We have close links with industry through research projects and consultancies. This wealth of experience means our students benefit from being taught by staff at the forefront of new developments. Our wide network of contacts brings real world experiences to the courses.

Students have the chance to join our very successful Formula Student team and put theory into practice by racing against other universities from around the world.

Course details

To qualify for a master’s degree you must take the compulsory modules, two optional modules and the dissertation.

Dissertations

These are individual research and development projects on a topic of your choice. These projects can be undertaken as part of a wider research project or within collaboration with an industrial partner.

Careers

Our graduates enjoy the very best employment opportunities, with hundreds of engineering students having gone onto successful careers in their chosen industry. Many of our students go on to work with leading motorsport companies, including directly into F1 teams and suppliers.

Compulsory modules:

- Advanced Chassis Engineering
- Advanced Vehicle Aerodynamics
- Laptime Simulation and Race Engineering
- Advanced Engineering Management

Optional modules:

- Vehicle Crash Engineering
- Computation and Modelling
- CAD/CAM
- Advanced Strength of Components
- Advanced Materials Engineering and Joining Technology
- Data Acquisition Systems
- Engineering Reliability and Risk Management

Student Profile

Ana Sanchez

Before I came to Brookes, I studied my bachelor’s degree in Mechanical Engineering in Universidad Autonoma del Estado de Mexico. I was also a Design Engineer at General Motors Mexico from 2012-2014 and a Supplier Development Trainee at Robert Bosch Mexico from 2011-2012.

I chose to study at Oxford Brookes firstly because of its reputation as one of the best institutions for Motorsport Engineering, not only in the UK, but the whole world. Also, its strategic location within the so called ‘Motorsport Valley’ made it the obvious choice to develop my career in motorsport.

Though it has been very demanding, I have really enjoyed the course here. Elements of practice and theory are well-balanced, so we get to put to the test what we learn in the classroom and gain invaluable experience for our future careers.

The best bits about studying at Brookes are the networking opportunities we are provided with: both professionally through industrial lectures, placements and experienced lecturers – and personally: working within a multicultural environment that allows students from different countries and cultures to explore what other people think and how they perceive the world.

I would say the best thing to do while being here is to try and make the most of all that the university has to offer: extracurricular activities, exceptional lecturers, good facilities and more. This experience gained will definitely help your future career.

I am now working as a Safety Development Engineer at Ford Motor Company.

Design Engineer at General Motors Mexico from 2012-2014 and a Supplier Development Trainee at Robert Bosch Mexico from 2011-2012.

Excellent connections with industry

At least one Brookes graduate in every F1 team

Industry led research projects

Industry standard facilities
Racing Engine Design MSc

The MSc in Racing Engine Design is intended to enhance and extend your knowledge in engine design.

The course provides an intensive exposure to an integrated design, simulation, modelling and analysis of racing engines. The analysis elements of the modules include structural optimisation, dynamics, internal combustion engine thermo-fluid dynamics, engine performance, tuning, mapping and monitoring.

Why choose this course?

The motorsport industry in the UK is a world leader and many of the world’s most advanced high-performance engines are designed here.

All our motorsports and automotive engineering courses are taught by staff with exceptional knowledge and expertise in their fields.

We have close links with industry through research projects and consultancies. This wealth of experience means our students benefit from being taught by staff abreast of the latest industry developments. Our wide network of contacts helps to bring real-world experiences to the courses.

Students have the chance to join our very successful Formula Student team and put theory into practice by racing against other universities from around the world.

Course in detail

To qualify for a master’s degree you must take the compulsory modules, two optional modules and the dissertation.

Dissertations

These are individual research and development projects on a topic of your choice. These projects can be undertaken as part of a wider research project or within collaboration with an industrial partner.

Careers

Our graduates enjoy the very best employment opportunities, with hundreds of engineering students having gone onto successful careers in their chosen industry. Many of our students go on to work with leading motorsport companies, including directly into F1 teams and suppliers.

Compulsory modules:

- Racing Engine Design
- Advanced Strength of Components
- Advanced Engineering Management

Optional modules:

- Advanced Powertrain Engineering
- Computation and Modelling
- CAD/CAM
- Data Acquisition Systems
- Engineering Reliability and Risk Management

The highlights of studying at Brookes are the many projects available and all are fully supported by the professors. I am working on combustion for my dissertation which is really interesting.

My employment prospects have been positively influenced by my studies as it is a high level degree which means I can look at top level positions.

My advice to someone who wants to study Racing Engine Design at Oxford Brookes is if you are as crazy as I am for engines then there is no better place to study than Oxford Brookes. I really like the university, campus and facilities and I suggest to anyone to come to study here.

I chose Oxford Brookes because it is the only university to offer the master’s that I am studying (Racing Engine Design) in Europe.

All the tutors and professors are very supportive and are always available if you have any doubt or need to talk or if you find yourself in difficulties. I am impressed with the level of knowledge and expertise of professors and tutors, which makes our lectures really enjoyable.

My favourite module is the racing engine design because engines are my passion, and in this module we have the opportunity to learn what real engines are. What I particularly like is the technologies that you find in F1 or space shuttles are treated as normal which is very exciting.

Before coming to Brookes I studied for a bachelor’s degree in Mechanical Engineering in Italy and after graduation I worked for two years as a motor bike mechanic in Australia.

Student Profile

Andrea Carretti

Before coming to Brookes I studied for a bachelor’s degree in Mechanical Engineering in Italy and after graduation I worked for two years as a motor bike mechanic in Australia.

Student Profile

Frederico Bengolea

Before coming to Brookes I was working for one year in Teyford near Reading for GTD Engineering, for a company restoring and manufacturing components for Ferrari. Before that I was working in Argentina for 6-7 years in the automotive field.

The highlights of studying at Brookes on the one side is the learning content: I have learnt a lot, and on the other side is getting to know the rest of the engineers, who are pursuing the same or similar aims as I am. You get to know the competition between the other universities thanks to Formula Student, and being able to work in teams with very different personalities and cultural backgrounds. We have students from all over the world studying here trying to get the best out of themselves, which is good.

After graduation I would like to keep working in engine design and/ or powertrain design, not only in racing engines, which was why I came to Brookes, but also focused on fuel efficiency, fuel economy and environmental aspects which we have been learning about on this course.

If you are thinking of studying Racing Engine Design, I would say go for it, nowadays it is quite scary to go and study internal combustion engines with the different energies that are coming in. The view that you will get here is much more open and wider than just racing engines. You learn a lot on thermal dynamics, energy flow and a lot of things that can be applied to any kind of engine. By the end you will be able to model any type of engine that you like, including electric, hybrid platforms or hydrogen, you will have the opportunity to learn what you think is the best way to go.
Research degrees

We welcome applications to study for Master of Science by Research, Master of Philosophy and Doctor of Philosophy qualifications. The department offers excellent facilities for study, including a range of dedicated laboratories and research areas.

An MSc by Research is a one year programme (full-time) while an MPhil normally takes two years of full-time study or three years part-time to complete. The PhD normally takes a minimum of three years full-time study or five years part-time to complete.

Many of the research projects are funded externally and are undertaken in collaboration with industry, universities and research establishments in the UK and worldwide. Doing an MRes, MPhil or PhD is an opportunity to work with these projects and make a significant contribution to the research and knowledge exchange. A PhD degree is widely recognised internationally as the ‘licence’ to practise as a research scientist or research engineer. Our research is internationally recognised. Research students have the opportunity to undertake a programme of Research Methods Training provided by the University’s Graduate School. They also have access to training in subject-related skills, such as Matlab, and generic skills, such as entrepreneurship and teaching in higher education.

Entry Requirements

Applicants should have, or expect to have, at least a 2.1 honours degree in an appropriate area, or equivalent experience and strong research skills will also be considered. The department is also able to consider proposals for new research projects from applicants in full-time employment who wish to obtain a research degree on a part-time basis, or on the basis of existing published research.

Assessment

The award of MRes, MPhil or PhD is made on the basis of a satisfactory thesis submitted and examined by at least two examiners. The candidate will normally be required to attend an oral examination, in the UK, on the programme of work and field of study.

One of our graduates, Ryan Wood, is now working for Colas Ltd, an organisation that looks at health and safety factors in automotive applications and in particular airbags. As a PhD student at Brookes Ryan secured funding to design and build a piece of equipment for deploying multiple airbags. The equipment collects data about the particles given off when numerous airbags are deployed. This equipment has also been used to model airbags.

Oxford Brookes moves to two wheels: Research projects using the department’s expertise are changing the landscape of the Speedway GP series

In January 2015 the department announced its exciting new collaboration with Speedway GP (SGP) and IMG. Speedway Championship is a series of stand-alone worldwide events over the course of a season which determines the Speedway World Champion. The project is looking at the research opportunities surrounding the technical development of the sport, which is being led by students and staff. Four research projects have been completed during the first year including a project supported by a postgraduate WISE Research Scholarship. The projects look at a range of different aspects of the sport; The focus of these projects is on the frame design currently used by riders and how it can be improved to increase the performance characteristics of the bike, and proposing a possible alternative design. The other projects focus on the feasibility and design requirements needed to construct an electric bike, which could be used as an alternative to the current methanol fuelled bikes, providing a similar performance could be obtained.

The research projects have been completed by final year MSc, MEng and BEng Mechanical Engineering students. Students’ experience of working with Speedway has inspired other students to get involved in the research around this exciting sport. The collaboration is continuing with more research projects for the coming year. The aim is for students to complete further research and development so that a proposal can be submitted for consideration that will alter the Speedway series and allow it to regain its popularity within the UK.
Entry requirements (applies to all postgraduate programmes)

You should normally hold a first degree equivalent to at least a British lower second-class bachelor’s degree in mechanical engineering or a related discipline. Applicants with relevant professional experience will also be considered.

English language requirements
If your first language is not English you must satisfy our English language requirement by providing us with evidence of a minimum IELTS score of 6.0.

English requirements for visas
If you need a student visa to enter the UK you will need to meet the UK Visas and Immigration minimum language requirements as well as the university’s requirements.

Full details on entry requirements and English language requirements is available on our website tde.bz/PG-entry-reqs.

WANT TO SEE BROOKES BUT CAN’T GET HERE?
GOT SOME QUESTIONS ABOUT OUR COURSES?
OUR VIRTUAL OPEN DAY IS THE ANSWER!

On our website you’ll find videos from our staff and students telling you everything you need to know about our courses and facilities.

Every year we hold a live question and answer session where you can put your questions to our panel of staff and students.

Virtual Open Day is your chance to explore Brookes online!

Can’t get to Brookes?”

try a Virtual Open Day!

Virtual Reality!
Listen to our staff and students talking about our engineering courses, anytime, anywhere.

Watch on Demand!
Missed our live session? Catch up on our question and answer session, broadcast from our very own TV studio. Send your questions to our team at mems-enquiry@brookes.ac.uk

Explore!
Want to know more about our facilities and see them for yourself? Walk around our labs and campus on a virtual tour. Discover the amazing facilities that our students use on a daily basis.

Experience what it’s like to be a Brookes student at:
mems.brookes.ac.uk/postgraduate/virtualopenday

R Building, the home of Engineering and our state-of-the-art facilities

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R Building, the home of Engineering and our state-of-the-art facilities

Entry requirements
You should normally hold a first degree equivalent to at least a British lower second-class bachelor’s degree in mechanical engineering or a related discipline. Applicants with relevant professional experience will also be considered.

English language requirements
If your first language is not English you must satisfy our English language requirement by providing us with evidence of a minimum IELTS score of 6.0.

English requirements for visas
If you need a student visa to enter the UK you will need to meet the UK Visas and Immigration minimum language requirements as well as the university’s requirements.

Full details on entry requirements and English language requirements is available on our website tde.bz/PG-entry-reqs.
Oxford Brookes Racing

Oxford Brookes Racing (OBR) is the award-winning Formula Student team from Oxford Brookes University. OBR has competed in Formula Student since its inception in 1999. Working to a budget the team designs, builds and races a single-seat car. The team is made up of approximately 150 students from across the department’s engineering courses.

Oxford Brookes Racing (OBR) was one of the first teams to compete in the Formula Student UK in 1999. The first entry was a wooden prototype chassis and it raced in the class 2 category. The early years of competition saw the team develop a variety of ideas and concepts including an aluminium monocoque chassis and the team’s first and only ‘wing’ car.

The 2002 competition marked the beginning of the team’s rise to the front, with OBR finishing 13th overall at FSUK. After the successes of the previous year, the 2003 season saw OBR win their first competition, finishing 5th overall and winning the coveted title of ‘Best UK Team’ for the first time, a feat that the team, to date, has won a total of five times in 16 years.

OBR regularly competes at FSUK (which races at Silverstone) and FSG (Germany). In 2004 the team had the opportunity to race in FSAE in USA. This included utilising race team facilities to develop its car. In 2005 the team returned triumphant after winning the skid-pad event for the first time in Michigan.

The mid-2000s were successful and innovative years, the team came 3rd overall and won the cost event and endurance, it regained the title of ‘Best UK Team’ for the third time. 2007 saw the team field two cars (combustion and electric cars) at FSUK and it was the only team to have both cars finish the endurance. At FSG the team finished in 8th position.

OBR won the skid-pad event for the second time at FSG and finished on the podium at FSUK in autocross, design and the business presentation. 2010 was the last time the team ran a space frame chassis. The car started as a combustion entry and by the 2011 season was fully converted to electric. 2011 saw a return to the aluminium monocoque chassis and the team was back at the front with a 4th place in design at FSUK and 3rd in autocross at FSG. In the 2012 season the team regained the Best UK Team title with its monocoque designed car.

2013 saw a new competition on the FS calendar, Czech Republic, where the team collected prizes in the business presentation and podiums in autocross, design and skid-pad events.

In 2014 the car had its first aerodynamic package, which is being continually developed with mentoring by experts from F1.

Brookes’ FS car in action

Brookes FS team testing driving conditions
Research and industry collaboration

There is a thriving research environment in the department, underpinned by well-established links with industry. The research is focused on issues of global concern and is organised into three cross-cutting, inter-disciplinary themes: Sustainable Engineering and Innovation (SEI); Low Carbon Vehicles (LCV); and Simulation, Modelling and Systems Integration (SMSI). Research in the department is supported by the UK Research Councils, the European Commission, industry and charitable foundations.

Sustainable Engineering and Innovation
The Sustainable Engineering and Innovation (SEI) theme of research at Oxford Brookes University draws together a collective of many different technological disciplines, highly successful research groups and individuals.

This approach provides for a strong multidisciplinary innovative and sustainable engineering solutions to both national and international issues concerning current and future environmental, social and economic needs.

The key focus areas of SEI include:
- Intelligent and integrated solutions for sustainable mobility.
- Closed-loop manufacturing through the development of smart materials, efficient processes and innovative design.
- Advanced sustainable materials and joining processes.
- Whole life energy analysis and low carbon solutions.
- Expertise in the use, manufacture and performance of carbon materials.

Simulation, Modelling and Systems Integration
The research carried out in the Simulation, Modelling and Systems Integration research theme enables complex systems to be analysed, designed and predicted. The work is outwardly focused and looks to develop solutions, which provide economic and social benefits, to real problems. The work is underpinned by high quality fundamental research in mathematics and engineering.

Low Carbon Vehicles
The Advanced Engines, Propulsions and Vehicles research group (AEPV) brings together scientific and industrial expertise for providing solutions for fuel efficient and low emission engines and vehicles. The group has six main research areas: combustion and fuels, particulate matter emissions, emissions assessment, powertrain simulation and performance evaluation, computational fluid dynamic simulation of engine processes and the design and development of high performance engines.

Collaboration
The department has excellent connections with industry and it is these connections that enable staff and students to be involved in ground-breaking research. The department collaborates with industry leaders such as BMW, YASA Motors, McLaren, Kawasaki British Superbike, BSI Speedway and Dallara.

Oxford Brookes moves to two wheels

Dallara

With the rise in popularity of Formula E, electric vehicle racing is beginning to conquer the world of motorsport. Oxford Brookes is collaborating with Dallara, a world-leading race car manufacturer, with MSc Motorsport students designing various aspects of an electric racing car.

The project was initiated after a visit from Andrea Toso, Head of R&D and US Racing Business Leader at Dallara in 2014. He was so impressed with the facilities and expertise at Brookes, that Dallara decided to start this ambitious project – developing an affordable electric racing vehicle.

In the first year of the project, a group of MSc students undertook research trying to find the most suitable parts for the vehicle, finishing with an initial prototype. This year the students have researched the following areas of development, with the intention to build a model of the vehicle:
- Battery design and development
- Powertrain design and development
- Feasibility study – aims to determine whether the current car design is feasible following the customer needs
- Aerodynamics and cooling system
- Suspension kinematics and dynamics – focus on hardpoint location, spring and damper selection, ARB and rocker design, tyre selection
- Full vehicle modelling and simulation.

Students have also produced a business plan which includes market analysis, sales strategies, as well as four-year financial projections. In 2016, the project was in its third year.

Dallara render superimposed in our auto lab

Research projects using the department’s expertise are changing the landscape of the Speedway GP series

At the Autosport International Race Car show the department announced its exciting new collaboration with Speedway GP (SGP) and IMG. Speedway Championship is a series of stand alone worldwide events over the course of a season which determines the Speedway World Champion.

Part of this collaboration are the research opportunities surrounding the technical development of the sport, which is being led by students and staff. Ole Olsen, triple World Champion, loaned one of his bikes to the department in support of this activity. Four research projects have been completed during the academic year including a project supported by a postgraduate WISE Research Scholarship.

Having a presence at a show like Autosport, the largest pre-season motorsport car show in Europe, has put Speedway onto the international stage. The department is working on ways to alter the current perception and trend in popularity in the UK; this research is ongoing and the proposal is predicted to give the series a sustainable future in UK motorsport.

A series of projects has taken place within the university looking at a range of different aspects of the sport:
- Alternative frame design to improve performance
- Feasibility and design requirements for an electric bike.
In September 2014 the Oxford Bus Company launched a redesigned and new look BROOKESbus, which uses Gyrodrive technology to help the buses reduce fuel consumption by around 20%. These new buses were designed with input from one of our alumni, Glen Pascoe – Glen studied motorsport engineering and graduated in 2006. He remembers regularly travelling with his now wife on the BROOKESbus and said: “As a Brookes alumnus I feel honoured that Gyrodrive will be making a positive impact on the current students and the university in general by helping to achieve its sustainable travel plans. I hope that my story will inspire all students to realise their potential and make a difference.”
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For more details please visit www.brookes.ac.uk/services/hr/eod or phone +44 (0) 1865 485929.

To obtain a large-print copy of (or sections of) this publication or to enquire about other formats please contact +44 (0) 1865 484848 or email query@brookes.ac.uk

All information is correct at the time of going to press (June 2016). Please refer to the University’s website for the most up-to-date details.