PROGRAM YOUR FUTURE: COMPUTING

Inspiring undergraduate courses at the cutting edge of technology
# CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Welcome</td>
</tr>
<tr>
<td>4</td>
<td>Facilities and Community</td>
</tr>
<tr>
<td>6</td>
<td>Computing at Brookes</td>
</tr>
<tr>
<td>8</td>
<td>Computer Science BSc (Hons)</td>
</tr>
<tr>
<td>12</td>
<td>Computer Science for Cyber Security BSc (Hons)</td>
</tr>
<tr>
<td>14</td>
<td>Robotics at Brookes</td>
</tr>
<tr>
<td>16</td>
<td>Robotics BSc (Hons)</td>
</tr>
<tr>
<td>18</td>
<td>Robotic Engineering BEng (Hons)/MEng</td>
</tr>
<tr>
<td>20</td>
<td>Artificial Intelligence BSc (Hons)/MSci</td>
</tr>
<tr>
<td>24</td>
<td>Computing Foundation</td>
</tr>
<tr>
<td>26</td>
<td>Placements</td>
</tr>
<tr>
<td>28</td>
<td>Supporting your studies</td>
</tr>
<tr>
<td>31</td>
<td>Entrepreneurship</td>
</tr>
<tr>
<td>32</td>
<td>Tech Show</td>
</tr>
<tr>
<td>34</td>
<td>Student Societies</td>
</tr>
<tr>
<td>35</td>
<td>Visiting the School</td>
</tr>
<tr>
<td>36</td>
<td>Postgraduate Programmes</td>
</tr>
<tr>
<td>38</td>
<td>Postgraduate Research</td>
</tr>
</tbody>
</table>
The School of Engineering, Computing and Mathematics (ECM) is a close-knit community of staff and students. With its own dedicated campus in Wheatley, the site is equipped with excellent learning and teaching facilities, including state-of-the-art labs, computer rooms and social learning spaces.

The school brings together teaching and research in engineering, computing and mathematics disciplines.

This is a lively, progressive and supportive place to study. We want to help you graduate as a well-rounded candidate for the cream of an ever-increasing number of jobs in the fast-evolving field of computing and its related industries. Students come from all over the world to learn with us and it is this diverse student population that keeps us focused on the delivery of engaging and relevant undergraduate and postgraduate courses. The school has international links with students studying computing degrees across the world in places such as Singapore.

In light of the recent surge in cyber attacks, major companies are looking closely at their IT systems to ensure that they are protected from any future vulnerability, which attackers might exploit. In answer to this skills gap we have launched our new courses BSc and MSc Computer Science for Cyber Security. Working closely with industry we develop courses that produce graduates with the knowledge and skills to complete a wide variety of tasks in this fast-paced industry.

A popular feature of our courses is the opportunity to spend a year in industry on a subject-related paid placement. This is usually between the second and final years of the course. This time in industry offers you the chance to put theory into practice in a real world situation while you gain valuable experience. We have a dedicated Placements Manager who can help find a good fit for you, and academic staff will support you throughout. Placements are not compulsory, but they are highly recommended.

Our research laboratories are home to our research students and, in the case of the cognitive robotics laboratory, a family of humanoid robots waiting for those of you who are fascinated by this fast-expanding area of research which touches every aspect of our lives.

The School of Engineering, Computing and Mathematics brings exciting opportunities to work together - delivering the highest quality teaching and learning, impactful research and best possible student experience in an interdisciplinary context. It is an exciting time to be at Oxford Brookes.

Professor Chrisina Jayne, Head of School

To find out about the professional accreditations that our computing courses have please check the course entries at www.brookes.ac.uk/ecm/courses/computing
The school is a technology hub with a vibrant community of students. Our staff and students work on leading projects, driven by intrigue and a desire to improve the world around us.

Students have access to purpose-built facilities, with state-of-the-art workshops, specialist labs and computer facilities.

The campus boasts the latest computing facilities to support your academic and career development. These include networking, telecommunications facilities and extensive robotics lab and computer-aided design lab.

We are not all about studying and hard work. We have invested in our social learning spaces, allowing you to work on new ideas individually or together with your peers. There is a free gym, tennis courts and football fields for those who enjoy sports. In the student lounge there is a table tennis table which is great for mulling over ideas with friends whilst playing a game or two. There is a large plasma screen with data and audio projection. There are plenty of networked computers with printing, photocopiers and scanning equipment access across the campus.

Our library facilities include a convenient collect and return self-service, rooms available for hire for presentations or group projects. Subject-specific librarians can support you with most queries that you may have.

**Cyber Security Lab**

There are two dedicated secure laboratories which provide students with ample opportunities to put theory into practice. Students are able to use the labs to audit an existing network, test security issues on a purpose built IT system, analyse malware and design and implement secure software.

**Robotics Lab**

This laboratory is home to a wide variety of robots giving our students real practical opportunities to develop new ideas around this exciting technology. The robots include Artie, a life-size humanoid robot, a quad of Naos, Archie, Robbie, Wendy and Ada, the mini bots and Quad car who are controlled by apps and our new addition BLU. BLU is a 3D printed robot. Our robotics students are developing body parts and movement capabilities for BLU as part of their course on our suite of 3D printers.
Computing

Engineering facilities
We have a wide range of labs and workshops for engineering. Whilst not directly connected to our computing courses, these are useful facilities to know about and have in the past presented students with opportunity to collaborate with each other.

AUTOLAB
- Engine Test Cells
- Dynamics
- Fluids Lab
- Mechanical Testing and Stress
- Joining Technology

Student societies
The university has many different societies to suit most students’ interest. If we don’t have one that suits yours, you can start one. The ones that are focused on computing are the
- Gaming society
- Computing
- Robotics

Within the school there is also the hugely successful Formula Student team, Oxford Brookes Racing, who are currently the UK’s best team. Oxford Brookes Racing is an integral part of our engineering degrees but with Formula Student now introducing a simulation category, there will be opportunities for the involvement of computing specialists.

Performance Augmented Lab
This is currently a research area, but our undergraduate students can get involved with projects. The Performance Augmentation Lab (PAL) seeks to close the gap between abstract knowledge and its practical application. Students research radical new ways of knowing something in principle to applying that knowledge in practice.

The lab has a good stock of smart glasses (Microsoft Hololens, Epson Moverio), EMG armbands (Thalmic Labs MYO), 3D scanners and cameras (Occipital Structure sensor, LEAP motion sensor, intel realsense), arduino for e-textiles and other items. This is an exciting new area of the school and real opportunity for students to get involved in ground-breaking projects.
Computing at Oxford Brookes

This is an exciting time to be studying computing, particularly at Oxford Brookes. We have a supportive and knowledgeable academic team who will provide the highest standard of teaching. The school has an active research community which gives our students, at all levels, the opportunity to get involved in ground-breaking projects.

The industry is constantly evolving and requires graduates who have a broad skills base. Our ethos is to not only give you those core skills but to provide an environment to allow you to develop your own ideas. An example of this was at our inaugural Tech Show where the variety and breadth of the students work on display had both the public and business visitors in awe of the standard of work and the innovative ideas.

Based in the heart of technology valley and near the historical city of Oxford, we are surrounded by leading technology companies who offer our students and graduates a work placement or the first step on their career. Our undergraduate courses are wide ranging and include our coveted Computer Science course and our new courses in Cyber Security and Robotics. Students across the school have taken part in many competitions such as hackathons and the Santander Business Awards, winning on numerous occasions. We have developed entrepreneur modules within our courses. The Innovation Hub provides an integrated approach to employability, research and enterprise within the curriculum, or as part of our students’ broader development. For more details on this see page 31.

We have a close-knit culture within the school with students and staff from all over the world. Students who have studied with us have come from the Far East, India, Russia and all over Europe. Each year the Faculty hosts an International Welcome event, which is very popular with our students. This event gives our new cohort the opportunity to meet other international peers and has helped our students to settle into university life.

Our international community doesn’t stop there. We have Oxford Brookes courses available in other countries such as Singapore. Those students have the opportunity to graduate at Oxford Brookes with on-campus graduates, a chance that some can’t resist. The most recent graduate was Cheitanyarccchitah (Tanya) Jagathesan and her family.

The school also hosts an action-packed diary of events during induction week to help you find your feet. One of these events is a ‘treasure hunt’ around campus, finding different characters placed at key locations. These are created by staff in the school uniquely for our new students. Previous treasure hunt characters have included Pokémon GO and Star Wars characters.

If you want to challenge systems, build innovative technology or design a new program, Oxford Brookes is the place for you. Here the possibilities are endless.
Arianna S

Before you came to Oxford Brookes what did you study and where?
Most of my time was spent worlds away from Computer Science as I looked more at natural sciences and the arts.

What made you choose Oxford Brookes as a place to study?
I was interested in Computer Science but did not have much experience so the Foundation year seemed a promising option for someone like me who was curious.

What did you think of the course while studying here?
From the Foundation year I managed to get onto one of the Bachelor programmes which was a lot of fun – many, many lab hours but I thoroughly enjoyed it. The academics within the department were approachable and keen to keep in touch if I wanted to get anything done, and the student support team were formidable - absolutely second to none. My department were incredibly supportive when I wanted to arrange to go abroad for both an exchange year and my industrial placement.

What were the best bits of studying at Oxford Brookes?
The people I got to meet and work alongside (students and staff included), the opportunities to travel and the shiny, shiny networking labs.

What did you think of the industrial placement aspect of your course?
Indispensable. I would highly recommend taking this year as it’s a great confidence builder. Some of my friends applied through existing programmes but I arranged a short term contract with a company that I wanted to work with, who I felt would equip me with skills I could take back for my final year.

Where did you do your placement year?
I worked for a small software development company in the USA.

What was your responsibility in the project team?
Working as part of a small and highly responsive software development team.

What experience and training did you gain during your placement?
I arranged with my employer to take a short course in software testing which helped me learn what would help in our own development process and be able to work more effectively as a software tester alongside the programmers.

After graduating from Oxford Brookes what were the next steps for your career and where are you working now?
The Centre for Doctoral Training in Cyber Security at the University of Oxford has taken me on as a PhD candidate so I am fortunate enough to be staying in Oxford for the next few years.

What so far have been the best moments?
Graduation was a dream. After seeing everyone work so hard to get through some fairly tough spots, getting our mortar board game on was such fun and I look forward to hearing about the great things that my graduating class goes on to do.

What so far have been the most challenging moments?
I have not yet met anyone who has taking pleasure in writing a thesis of any description. The nature of my degree meant that there was a lot of technical troubleshooting involved. I found it difficult to keep running at the same problems when I had no confidence in my ability to solve them but I found my lecturers were right there to support me in figuring things out and my friends were banging their heads against the same walls.

My lecturers were there to support me.
Computer Science BSc (Hons)
As courses are reviewed regularly, the module list you choose from may vary. Modules are compulsory unless otherwise stated.

**Year 1**
- Problem Solving and Programming (double module)
- Networking and Multimedia
- Foundations of Computing Systems
- Information Systems
- Object Oriented Programming
- Dev Ops
- Mathematics for Computing

Computer programming is a key skill for computing professionals. You will be taught throughout the year and much of your other study supports this directly. You will also be introduced to computer networking and the role of information systems in business.

**Year 2**
- Innovative Product Development (double module)
- Software Development with C and C++
- Data Structures and Algorithms
- Foundations of Security
- Innovative Product Development (double module)
- Databases
- Foundations of Computation
- Web Application Development

Year 2 programming covers new languages, more advanced coding techniques and the fundamental theory that underpins programming. You will also study key areas of computer security from network penetration to secure programming. Agile development and effective team work are taught in a module that then allows you to practice them while developing your project throughout the year. This module also helps prepare you for becoming a computer professional both through learning of the professional, social, legal and ethical issues that you should consider and through developing your employability skills. You will also study modules teaching web and database development.

We encourage you to take a supervised work placement in the computer industry for 12 months between Year 2 and your final year. More and more students are finding that a placement benefits both their final-year studies and career prospects. Possible placement organisations include IBM, Microsoft and PepsiCo.

It is possible to change your programme of study to include or exclude the work placement option up to the end of your second year.

**Final year**
- Project (double module)
- Software Engineering
- Artificial Intelligence
- Optional module e.g. Machine Learning or Game Development
- Project (double module)
- Cloud Computing and the Internet of Things
- Advanced Object Oriented Programming
- Principles of Secure Operating Systems

In the final year, you will carry out a project on a topic of your choosing. Alongside this you will expand your programming skills further and extend your knowledge and skills into other areas. You will also study the Software Engineering process and can choose subjects such as Machine Learning or Game Development.

**After graduation / careers**
We have an excellent record of students gaining full-time employment on graduation, often with their industrial placement company or organisation.

**Entry qualifications**

**Typical offers**
- A-level: grades BBC or equivalent, preferably including science subjects.
- IB Diploma: 30 points, preferably including science.
- BTEC: National Diploma with a DDM profile, preferably in a science subject.

**Specific entry requirements**
- GCSE: grade C minimum in both Mathematics and English Language.
"The staff at Brookes have been extraordinary."

Oliver Hirschfield Computer Science BSc
Before you came to Oxford Brookes what did you study and where?
Physics, Politics and Psychology at Haileybury, Hertford.

What made you choose Oxford Brookes?
I loved the choices available to me, both inside and outside the computer labs. The location is good and the facilities are great. Everyone I met when I came to look around was friendly, and helped me to understand the opportunities available here.

What do you think of the course?
The course is well designed and allowed me to pick lots of options, from web technologies to system administration. The assignments were well laid out and allowed me to use my knowledge from the lectures and lab sessions during the week.

What are the best bits?
Having the choice to be able to work in a number of places around the campus, and having the facilities always available. The staff at Oxford Brookes have been extraordinary, always making time for students who need more help or want to explore the topics further.

What advice do you have for others?
Use your time to explore the subject as much as possible, and make use of the facilities while you have them.

What are your plans for when you’ve completed your course?
I plan to continue to run a company I set up while at Oxford Brookes based around ticket and event management in Oxford. The contacts I made at Oxford Brookes have helped me to develop and implement a new technology into the field. I will also continue to work on another company I started while at Oxford Brookes, based around the training and management of the High School Model United Nations, and the conferences surrounding in the UK and the USA.

What advice would you give to others wanting to start their own businesses?
Do the research first. There are thousands of people at Oxford Brookes who might be able to help in some way. Go to the Oxford Brookes Entrepreneur networking events while you are studying, and start building a team around your idea. Students at Oxford Brookes are already doing this, and I’m sure there will be people interested in working with you.

What would you like to see for the future for your business?
Grow the business outside of Oxford and start expanding the features and technology into other areas.

There are thousands of people at Oxford Brookes who might be able to help you start a business.
Go to the Oxford Brookes Entrepreneur networking events and start building a team around your idea.
Computer Science for Cyber Security BSc (Hons)
The UK Government’s National Security Council identifies cyber attacks as one of the highest priority risks for the country. Demand for computer science graduates with cyber skills far outstrips supply.

This course equips students with the fundamental tools and knowledge to quickly adopt the emerging technologies in this fast changing field.

The focus is on professional and business skills, techniques and ways of thinking that are needed to be able to align technical security requirements with business needs.

Our dedicated security laboratories provide students with ample opportunities to put their skills into practice - from auditing an existing network and IT system for security issues to analysing malware and designing and implementing secure software.

Course content
We have modern cyber security, networking, and server laboratories that offer the opportunity to develop practical expertise with high-end professional equipment and software. These include enterprise-level Cisco equipment, a visualisation platform, as well as a cyber security range that allows students to take turns at attacking or defending an IT infrastructure.

In year 1 you will study networking, computer systems and computer programming. The computer networking modules cover the Cisco syllabus preparing you to be able to take Cisco professional examinations if you wish.

In year 2 and your final year, we’ll build on these subjects. You’ll also study modules on cyber security, networking, operating systems and software development.

We encourage you to take a work placement in the computer industry for 12 months between year 2 and your final year. Students find that a placement benefits their final-year studies and career prospects. Previous placement organisations have included IBM, Ericsson and Cisco.

Central to your final year is a major project that allows you to apply your knowledge and skills to a real problem of your choice. This gives you the opportunity to enhance your media or networking skills. Alongside this you will study key topics in cyber security and the software engineering process, and the developing areas of cloud computing and the Internet of things.

As courses are reviewed regularly, the module list you choose from may vary and some modules will be compulsory. The full list of course modules can be found in the online prospectus at www.brookes.ac.uk.

After you graduate
As the demand increases for professionals capable of developing and deploying IT systems and software with a focus on security issues, so does the employability of our graduates. Our course is designed to address the need for IT security professionals, penetration testers, digital forensic investigators, software developers, systems engineers and technical analysts, among many other high profile cyber security related roles.

With world-class research and superb links with the industry, Oxford Brookes is also one of the best places in the UK to study technology at postgraduate level, whatever your subject interests.

Entry qualifications
Typical offers
- A-level: grades BBC or equivalent, preferably including science subjects.
- UCAS points: 112, preferably including science subjects.
- IB Diploma: 30 points, preferably including science.
- BTEC: National Diploma with a DDM profile, preferably in a science subject.

Specific entry requirements
- GCSE: grade C minimum in both Mathematics and English Language.
The school has engaged in world-leading research in Artificial Intelligence and Machine Learning for more than 15 years. This area of work has grown considerably over the past five years within the school. Robotics students and researchers have access to an extensive Cognitive Robotics Laboratory and dedicated teaching lab. Within this laboratory is Artie, a lifesize Robothespian humanoid robot, who was the first robot to arrive at the school.

The school’s first industrial style robot was Baxter, another humanoid robot for research and teaching. Baxter is safe around humans because he utilises Series Elastic Actuators that enable force sensing at every joint, so a collision between Baxter and a human or object will be detected and Baxter will stop. Baxter also has three cameras (two in the wrists and one in the head), position, velocity, and torque sensing on every joint, a 360º sonar array, 3-axis accelerometers and infrared rangefinders in each wrist. Baxter is a versatile platform, based on ROS, and he is extensively used by the robotics students during their course. This has resulted in interesting student projects and makes Baxter a fun demonstration of robotic capabilities.

Other entertaining additions to the lab are the Nao quartet Robbie, Archie, Wendy and Ada. They are 58cm tall humanoid robots with sensors, motors and software which can be programmed and animated. More recent additions are the Darwin Mini Bots, which students programme and control, and the Cozmo robots that they use for their Cognitive Robotics work.

The Cognitive Robotics Lab has the best facilities for robotics. We have numerous 3D printers with which students can bring their robotics designs to life. Our final year students have added the construction and programming of our own 3D printed robot called Blu. Blu was designed and built by our Robotics Technician, Alex Austin, who supports our students on the programme, and develops our own robotic platforms.

Utilising cutting edge technology, we have developed a commercial cleaning robot for the healthcare sector. In the future this will mean a robot can do basic cleaning tasks such as hoovering which leaves tasks that required the use of chemicals or other external anomalies for a workforce to complete.

Another area of robotics that the school is focusing on is the elderly and those living alone. By developing the ability through augmented reality for loved ones to check in on their relatives whilst on holiday via a robot.

Using all our robots, students studying our BSc Computing for Robotic Systems or BEng/MEng Robotic Engineering, will be able to design, develop, construct and program a robot from basic principles learnt on the courses. The programme focuses on the software engineering of robots, providing an essential approach to make robots truly functional and useful. These are some exciting new projects that are becoming reality that students can become involved in as part of their course.

In addition to these commercially available robots, the Cognitive Robotics Group, part of the school’s Intelligent Systems Engineering Centre, designs, builds and tests its own robotic kit.

Take a look at their web page to see the exciting research they are engaged in: www.brookes.ac.uk/ecm/research/computing/cognitive-robotics.
Artie, the first humanoid robot to join the department, has been busy winning the hearts and minds of a huge number of humans. He appeared as an anchor on the CNBC business news channel and then appeared with his ‘minder’, Professor Nigel Crook (Head human) on BBC Breakfast TV. His other credits to date include BBC Newsround, BBC Radio Oxford, ITV Meridian and BBC South Today.

Artie’s most spectacular appearance was as a major attraction at Oxford Brookes’ ‘Live Friday’ event at the Ashmolean Museum. The queues wanting to interact with Artie snaked round the museum exhibits and out of the door. Artie also regularly entertains visitors to Oxford Brookes at open day events. Artie also helps students and researchers to learn more about intuitive ways to interact with robots. Students studying robotics at Oxford Brookes will quickly count Artie amongst their friends.

Artie says: “I am one of a few full-size human droid robots based in the UK and I’m lucky enough to be living here at the university.” Now the he has been joined in the lab by Baxter the research robot, the Nao quartet and the Mini Bots, he is enjoying the company.

**Artie helps students learn about more intuitive ways to interact with robots.**
Robotics BSc (Hons)
The field of robotics is rapidly increasing in importance and popularity, affecting almost all areas of modern life. This is the perfect time to equip yourself with highly marketable skills by studying this fascinating subject.

The BSc in Computing for Robotic Systems emphasises the importance of skilfully integrating computer science into robotic systems development. Our course enables you to become effective and qualified in both areas. We will teach you almost the entire robotic system, from how to handle low-level hardware, through the middleware control systems, all the way up to cognitive robotics at the highest level.

Course content

In year 1, you will start developing the fundamental skills that you will hone and extend during the rest of your degree. You will develop computer science skills through the study of programming, information systems, computer systems and mathematics. Additionally, you will acquire the foundations of robotic systems in the compulsory double module Introductory Robotics. In this module you will be taught using a hands-on project based learning approach, using both real and virtual robots to guide your learning.

In year 2, you will extend your understanding using modules that will range from further programming, and software development, to foundations of computing, and the social, ethical and legal issues associated with computer science. In the compulsory module Robotic Systems Engineering, you will also intensively investigate the middleware aspects of these systems, which is an important emerging skill requirement.

The compulsory double module Advanced Robotics, will enable you to apply the skills acquired in the other modules, and investigate further aspects of robotic systems using project based learning. This will culminate in you designing, developing, constructing, and programming a robot from basic principles.

We encourage you to take a supervised work placement in the computer industry for 12 months between year 2 and your final year. More and more students are finding that a placement benefits their final-year studies and career prospects.

On returning to university for your final year, the experience you have gained invariably improves your academic performance. In addition, we have an excellent record of students gaining full-time employment on graduation, often with their industrial placement company or organisation.

It is possible to change your programme of study to include or exclude the work placement option up to the end of your second year.

In your final year, your dissertation is the opportunity to carry out a significant robotics project of your choice, supervised on a one-to-one basis by a member of staff. Alongside this project, you will also study advanced modules in the areas of security, machine learning, machine vision, and cognitive robotics. These will be supplemented by optional advanced modules, some covering skills specific to robotics, others covering more generally applicable computer science skills.

As courses are reviewed regularly, the module list you choose from may vary and some modules will be compulsory. The full list of course modules can be found in the online prospectus at www.brookes.ac.uk.

After you graduate

Careers in robotic systems are growing rapidly with projected employment requirements growing ever more. Career opportunities include all aspects of robotic development, with particularly employment in robotic middleware development growing exceedingly fast.

The field is under continuous evolution with many research prospects and innovation possibilities. New and existing companies are continuously developing new robotic applications for virtually every aspect of a modern society. Career prospects in all areas of computing are excellent and expanding rapidly.

Our computing graduates have great success in finding employment. This can be in business, industry, research or education.

Entry qualifications

Typical offers

- A-level: grades BBC or equivalent, preferably including science subjects.
- UCAS points: 112.
- IB Diploma: 30 points, preferably including science.
- BTEC: National Diploma with a DDM profile, preferably in a science subject.

Specific entry requirements

- GCSE: grade C minimum in both Mathematics and English Language.
Robotic Engineering BEng (Hons)/MEng
Robot technology is being developed by many companies; investment in this area has increased as robotics becomes part of our daily lives. We have been involved in research and education in this area for more than 10 years.

- Hands on experience of building and programming robots
- Opportunity to learn the computing that controls the robots
- Understanding a range of creative in this area
- Join the robotics society and build and compete in national and international competitions
- Join Formula Student to design, build and race autonomous cars
- Taught by electrical, mechanical engineering and computing and robotics specialists and leaders in their field

Year 1

In year 1 we will build a solid foundation of knowledge of robotics. A major part of this will involve practical sessions learning to handle, develop and control robots.

Year 1 modules
- Engineering Mathematics and Modelling I
- Robotics & Electro-Mechanical Design & Practice I
- Introduction to Statics and Dynamics
- Basic Electrical Engineering
- Introductory Robotics

Year 2 and 3

In the second year, you will learn the process of design, building on your ideas from the first year, improving these by analysing and testing. In the third year you will use the knowledge of the previous two years to design and build a complete robotic system.

Year 2 and 3 modules
- Engineering Mathematics and Modelling II
- Engineering Simulation, Synthesis and Design
- Electric Machines and Drives
- Control Technology
- Software Development in C & C++
- Advanced Robotics
- Management, Ethics, Energy and Sustainability
- Engineering Project
- Advanced Digital Electronics
- Sensors & Data Logging
- Machine Learning
- Real-time Embedded Robotic Systems

Placement year

You will have the opportunity to complete a year working in industry, between the second and final year. It is usually paid employment and your chance to work in your chosen field of interest. The school has a Partnerships and Placements Manager who will support you in gaining employment. Our students say the year developed their skills and knowledge professionally and personally, solidifying what they have learnt during their course.

Accreditation

After you graduate

Students will be able to apply for roles in a wide variety of fields that include design, analysis, research and development (R&D), testing, technical sales, production, business analysis and simulation. A number of companies are moving into the field of robotics in addition to those that manufacture robots and those that develop software for robotic systems. These include defence, automotive, racing, materials, aerospace, government and the civil service.

Entry qualifications

Typical offers
- A-level grades BBB, one subject must be mathematics.
- UCAS Points 120 points, one subject must be mathematics.
- Physics or Engineering Science subjects are also highly desirable.
- BTEC Certificate or Diploma in an Engineering discipline, at least five distinctions including mathematics.
- HND course (with at least four distinctions including mathematics) with mathematics and Engineering Science.

Students with alternative subjects will be given consideration.

English language requirements

The university’s English language requirements in IELTS levels are as follows:
- 6.0 overall with 6.0 in reading and writing, 5.5 in listening and speaking
Artificial Intelligence BSc (Hons)/MSci

This course is subject to validation
From Siri to self-driving cars, artificial intelligence (AI) is progressing rapidly. AI could hold the answer to many of the challenges organisations face today.

The Artificial Intelligence degree has been designed to provide you with the skills, knowledge and understanding necessary to pursue careers at the cutting edge of AI and implement innovative, technological solutions for real world problems.

Course content
In year 1, you will be introduced to the fundamentals of AI and begin acquiring the key skills needed to excel in this exciting field. You will study an introduction to both robotics and object-oriented programming, two essential components to the application of AI. You will also study units such as Problem Solving and Programming, and Mathematics for Computing. Both of these units have been recognised as being vital for a successful career in the computing and AI industries.

In year 2, you will build upon the skills you have acquired in computer programming and begin exploring innovative product development. You will learn about software development, databases, and study the foundations of cyber security.

You will be strongly encouraged to take a work placement in your third year of study, doing supervised work experience in commerce, industry or the public sector. A work placement will give you demonstrable experience working in industry and consolidates your understanding so you can apply your knowledge in a work environment.

On returning to university for your final year, the experience you have gained from the placement will directly improve your academic performance. You will study exciting, creative modules, such as Computer Game Development, Cognitive Robotics, Deep Learning and Machine Vision. You’ll examine the ethical issues the industry faces around AI and data, and apply all of your learning for your final project.

The MSci route provides further specialisation in the development and integration of complex AI applications. You will deepen your knowledge in Machine Learning, Big Data and the Cloud, Data Visualisation and Intelligent Autonomous Systems.

After you graduate
You will graduate with a deep understanding of the fundamental principles of artificial intelligence, informed by computer science concepts and practices, strong technical skills in software development, as well as valuable transferable skills such as problem solving, team working, communication, time management and self-motivation, ready to apply to the world of work. The optional work placement provides invaluable real-world experience. Career options are abundant in the areas of AI driven app development, machine learning, data science and intelligent systems.

Entry qualifications

Typical offers
■ A-level: grades BBC or equivalent, preferably including science subjects.
■ UCAS points: 112.
■ IB Diploma: 30 points, preferably including science.
■ BTEC: National Diploma with a DDM profile, preferably in a science subject.

Specific entry requirements
■ GCSE: grade C minimum in both Mathematics and English Language.
“I was given a lot of responsibility and opportunities to take on exciting projects.”

Kainat Tariq
Information Technology Management for Business BSc
Kainat Tariq, from the UK is studying ITMB, full-time. She has just completed her placement year at General Electrics (GE) and will be returning to Oxford Brookes to complete her final year.

Before you came to Oxford Brookes what did you study and where?
I studied Computing, Business and Sociology at Banbury Academy Sixth Form.

What made you choose Oxford Brookes as a place to study?
I wanted to be close to home which is why I chose Oxford Brookes.

What do you think of the course now you are studying here?
I think the ITMB course it brilliant. It’s given me endless opportunities and I’ve been able to develop new skills which I can benefit from in life. This course isn’t just based on computing, it combines computing with the world of business which I think is important.

How does your scholarship or bursary enhance your experience of the course?
I was able to use the funding to help pay for resources such as text books.

What are the best bits of studying at Oxford Brookes?
I love the people at Oxford Brookes. Everyone is super nice and easy to talk to. The lecturers go out of their way to help you and that’s so important when you’re learning.

I also like the fact that the university is so diverse. I’ve made friends with people from all over the world and it’s been nice to learn about their culture.

What advice do you have for others?
My advice for others is

■ Try new things, you might actually like something.
■ Keep on top of your university work. It’s really easy to fall behind. So make sure you attend every lecture, seminar and workshop.
■ Ask questions if you’re stuck. The lecturers do actually want to help you.
■ Look after your mental health. That’s more important than getting good grades at university.

What do you think of the industrial placement aspect of your course?
I liked every minute of it. I was learning new skills every day and I learned from my mistakes. Since the very first day, I was given a lot of responsibility and opportunities to take on exciting projects. Working at GE has given me a better work ethic which I know will benefit me in the final year.

Where are you doing / did you do your placement year?
General Electric in the IT department.

What is / was your responsibility in the project team?
My responsibilities included

■ Scrum master for my agile team.
■ Creating SQL Queries and creating visualisations on business intelligence tools to help the business save money.

What experience and training are you gaining / did you gain during your placement?
The experience that I gained from my placement:

■ Data Analysis through SQL.
■ Creating visualisations through Spotfire.
■ Managing Agile Projects through Rally.

The training that I received included:

■ Scrum Master.
■ SQL.
■ Spotfire.
■ General Health and Safety.
■ Problem Solving.
Computing Foundation
If you want to study computing or information technology, but you don’t have the right qualifications to enter a university degree course, then the Computing Foundation course might be just what you need. This one-year course is designed to improve your general skills in computing, mathematics and information technology.

Our course includes plenty of practical work too: laboratory and practical sessions give students hands-on experience with the latest software. Surgery sessions are held in mathematics to help you to bridge any gaps in your mathematical skills.

There is demand for graduates in all areas of computing, digital media and information technology: our foundation course is an excellent start to a career in these fast moving and expanding industries.

This is normally a one-year course and you will need to take a total of eight modules in two semesters. As courses are reviewed regularly, the module list you choose from may vary and some modules will be compulsory.

The full list of course modules can be found in the online prospectus at www.brookes.ac.uk.

After you graduate

Successful completion of the course enables you to progress onto one of our degree courses in computing or mathematics.

If you do not wish to continue onto a degree course, the foundation course provides the opportunity for you to improve your technical knowledge before entering industry.

Entry qualifications

Typical offers

- A-level: grades CC or equivalent.
- UCAS points: 64.
- IB Diploma: 24 points.
- BTEC: National Diploma with 3 passes.
- Mature students with relevant experience, including a substantial period of suitable employment, are welcome to apply.

Specific entry requirements

- GCSE: grade C minimum in both Mathematics and English Language.
- You should be aged at least 18 and hold recognised qualifications to A-level standard, but with grades insufficient for entry to a degree-level course.
A great range of companies offer placements to our students. These range from multinationals to local employers who may recruit just one student.

Students have previously had placements with companies such as Accenture, BBC, BMW, Cisco, IBM, Microsoft and Sophos.

ERASMUS scheme

Although most industrial placements take place in the UK, placements can be anywhere in the world. There may be funding available through the Erasmus scheme to support a work placement in Europe. We may not be able to arrange an academic visit if you choose to complete your placement overseas, but you will still be supported by us while you are there.

For information about the Erasmus scheme, see www.brookes.ac.uk/international/study-abroad-and-exchanges/going-from-brookes/european-work-placements

Placements take place between the second and final years of a degree programme. Second year students are given training in preparation for placements through guided lectures, seminars and 1:1 tutorials.

The university’s Careers Service and Faculty Partnerships and Placements office provides help with CVs, applications and interview techniques to help you gain your preferred placement.

Once you are out on placement, you will be supported by a member of the academic staff who will arrange to visit you whilst you are there.

In the spring of your placement year we arrange a recall conference with the school, so that all placement students can meet in person to share experience and learn about any future developments at Oxford Brookes. This prepares you for your return in September. You will find it very useful to reconnect with both the school and your fellow students at this point.

Remember, a placement year is not a compulsory part of degree programmes in the School of Engineering, Computing and Mathematics, but students who include this year invariably find that it enhances their final year of study and their final year project.

For more information about placements, contact the Partnerships and Placements Office: tdeplacements-enquiry@brookes.ac.uk
Toyota, IBM, Google, BBC, BT and some smaller technology companies in Oxford and other locations.

With the help of the teaching and employment resources, I have been able to land a placement year at the BBC as a trainee software engineer. This placement has been a really great opportunity for me to use the knowledge I gained at university to develop new products and improve existing software application for the BBC News application. It has also helped me to acquire new technological and personal skills. The skills I will gain from this placement will undoubtedly help me to get a better idea of the project I want to do in my final year and will help me to acquire the technological skills to do it.

"This placement year at the BBC as a trainee software engineer has been a really great opportunity for me."
Supporting your studies

Coming to university is more than just about getting your head down and studying. We also want you to enjoy studying with us. In order to do that you need the right kind of support. We have put in place systems that can offer you help when you need it.

Within the school we have a full-time Student Support Coordinator, Sam, who is there to help you sort out any problems with your academic programme. You can also feel confident about chatting to him about any other problems you might have as all your conversations with him are treated as confidential.

You will have your own Academic Adviser who can talk to you about any trickier aspects of your programme and help you to get the best out of your course. You can also seek advice from other academics who teach on your course. Academic tutors have nominated open office hours and you can also book an appointment with them via Google Calendar.

The Partnerships and Placements Manager, Andy, is available to help you if you would like to complete an industrial placement year.

The university also offers a further useful range of support.

**Counselling**
You can talk to a counsellor about any concerns you have, whether personal or academic, free of charge and in total confidence.

**Disability and Dyslexia Service**
Advice and support is available from the pre-application stage onwards.

**Medical and dental services**
There is a medical centre and a dental surgery on Headington campus.

**Finance**
The Oxford Brookes finance team can assist you with issues concerning student finances and support including scholarships and bursaries.

**Mature students**
We offer part-time study options; childcare at our excellent nursery; study support through Upgrade as well as from your academic adviser; and advice on finance.

**Religion**
We welcome students of all denominations and faiths. We offer various services on-campus and churches, mosques and a synagogue can also be found in the city. Halal and kosher food is also available on campus.

**Nursery**
Oxford Brookes has its own well-equipped and professionally run nursery, available for children aged between four months and five years.

**Brookes Union (students’ union)**
Their motto is “Here to help you…” They offer a range of services for students, they host student societies, they run an advice service and they even run a safety bus service.

Full details of all the services offered by the university can be found at [www.brookes.ac.uk/studying-at-brookes](http://www.brookes.ac.uk/studying-at-brookes)
Before you came to Oxford Brookes what did you study and where?
Before Oxford Brookes I completed a Foundation Degree in Computing at Abingdon and Witney College, an affiliate college that allows progression into the final year as a “top up” to an honours degree.

What made you choose Oxford Brookes as a place to study?
I like Oxford as a city and it was already local to where I lived. Feedback from the open day students encouraged me that you can learn the skills required without too much prior knowledge.

What do/did you think of the course while studying here?
The course has a wide selection of choices for modules beyond the compulsory ones. The content ranges from theoretical to practical skills in programming to help you integrate into employment.

What are the best bits of studying at Oxford Brookes?
The lecturers are open to discussions and questions in their lectures. The workload is balanced between exams and coursework, so you can excel in whichever you prefer.

What advice do you have for others?
Use the experience to begin figuring out what you would enjoy doing post-graduation. Most of the time that would entail something you excel at, but even discovering a new field can be the direction you want to focus on. If you don’t know where to begin, consider placements and internships to give you a taster.

What are your plans for when you’ve completed your course?
After completing my placement, I converted to part-time to continue working for BMW. I am now on my third job with them as a DevOps Engineer maintaining the UK plant’s (Plant Oxford, Hams Hall, Goodwood) IT production systems (e.g. logistics, quality, and tracking). I’ve also begun working in the Paint Quality feature team as a start-up/rollout manager for a new paint application that will see me travelling independently to every BMW plant.

What did you think of your placement year at the BMW Oxford Mini Plant?
Participating in a placement year changed my life. It allowed me to find a company that I loved working for and gave me a real experience into the working world. The placement helped during my final year of studies as I had a fresh mind-set of how to apply myself. The placement year arguably contributed to the First classification of my degree.

What did you work on?
Creating an Overtime Requesting System to be used across Plant Oxford to help management organise their team’s requests and ensure that the correct quota of overtime has been requested to avoid overspending. This was primarily using C#, .NET and Oracle databases.

Who was the project team?
Production Steering and Support in the Assembly Division.

What were your responsibilities on the team?
My responsibilities included providing software development for a manufacturing environment as well as database management, including the creation of reports for the plant. I was involved in innovations within Assembly and I acted as an interface between Plant Oxford’s IT team and Assembly.

What experience did you gain?
I gained experience in applying software development practises learnt at Oxford Brookes to real world projects. I learnt many new languages, systems, and development techniques. By far the most valuable gain was the ability to work with people with a diverse set of backgrounds, ranging from engineering to logistics. I often supported senior management daily with niche IT-based tasks.
Jared Reabow, a dual nationality British and South African studied Computer Science full-time.

Before you came to Oxford Brookes what did you study and where?
Engineering, electrical and composites design at OCVC (Oxford Cherwell Valley College) and then a Foundation degree Computer Science at Abingdon & Witney College (a course run by Oxford Brookes).

What made you choose Oxford Brookes as a place to study?
It was convenient, with ability to commute to via car. The foundation degree and final year was economically more viable than a normal degree and in my opinion it was better because of a more 1 on 1 education.

The facilities looked very smart, with development being a clear goal of the university and the attitude of inclusivity and diversity was attractive.

What did you think of the course while studying here?
It was very challenging but also very interesting. The course is very challenging.

What are the best bits of studying at Oxford Brookes?
Meeting people from around the world, people that choose Oxford Brookes because of its inclusivity of people from all backgrounds.

What advice do you have for others?
For many years through school and life, I often convinced myself that it is ok that I didn’t do well because everyone else didn’t either, or someone did worse. But one day I realised that it doesn’t matter what people around you do, or achieve, you will have to live your life with the choices and the results you get, so always strive to do the best and be the best you can.

Whilst on my full time course, I also worked 4 days a week and completed an additional module, It is true I didn’t get to have as much fun as I would have liked, but if you think about it, work hard now, and you will have much more freedom in the future. Don’t work now and you may end up in an area you have no passion for.

Foundation degrees are great. You have a qualification at the end of the first two years which you can top up to a full degree should you wish to continue. Oxford Brookes provides high quality content and gives you access to all the facilities as if you were on the normal course, but you have the flexibility of the foundation degree.

After graduating from Oxford Brookes what were the next steps for your career and where are you working now?
After graduating, I took some time for myself to do things I had halted, hobbies, projects and socialising.
First, I designed and built and battled, battle robots for mini robot wars.
Secondly, I completed various projects I halted when studying became my priority.
Thirdly, I took my time to find a role that suited me. My logic was this: Why get into a job that is ok, when you can get a job that is great, I have spent years earning my degree, and I owe myself a role that will challenge me.

What so far have been the best moments?
Walking into a new company and filling with glee after seeing technology that I know will shape the future of mankind.

What so far have been the most challenging moments?
Walking into the interview room, doubting I have what it takes, trying to remember that at worst they say no.
Entrepreneurship

Developing your entrepreneurial skills with The ICE Qube

Ever had a lightbulb moment and wanted to take your idea and make it into reality? Here within the school we nurture and encourage entrepreneurial ideas. We haven’t just bolted on employment and entrepreneur sessions as an optional extra, we have incorporated it within our curriculum. We believe that the landscape for employability is changing. Technological advances are disrupting the conventional employment route for our students. For example, students might develop their own business ideas, whilst working to supplement income by taking on contract work. These new models of employment can be a successful career option if supported and nurtured.

The ICE (Innovation, Creativity and Entrepreneurship) Qube is the name of the Oxford Brookes University’s pre-incubator physical space which aims to provide students and staff with an environment where start-up business skills can be nurtured. The provision of ICE Qube is an excellent way to learn the challenges and practicalities of building businesses.

ICE Qube is a strategic ecosystem which fosters staff and students’ innovation, research and entrepreneurship. The ‘innovative’ environment is cultivated using a range of educational modules and programme activities. This gives students the practical and theoretical knowledge required to recognise the opportunities and to act on them.

ICE Qube aligns to Oxford Brookes University’s guiding principles. These are confidence, enterprising creativity, connectedness and generosity of spirit.

Confidence - We have confidence in the ability of our students and provide them with opportunities to suit their needs, ranging from discovery to immersive learning experience.

Enterprising creativity - Students are able to explore creativity and ideas using the tools of innovation and entrepreneurship. They learn to become the change makers.

Connectedness - We believe in learning by doing. We nurture students by providing hands-on experience.

Generosity of spirit - We believe people flourish in a culture of respect and support. ICE Qube provide students an immersive experience, allowing them to develop better collaboration within their businesses.

In the latest National Student Survey 80% of Computer Science students and 85% of Information Technology for Business students said they were satisfied with the quality of their course.

Unistats 2018

£26,000
Computer Science graduates earn on average £26,000 per year within six months of graduating, which is above the average.

Unistats Salary (pub. 2018)

£30,000
Brookes graduates earned £30,000 on average 3 years after completing computing courses.

Unistats Salary (pub. 2018)
The Tech Show is our annual event at the School of Engineering, Computing and Mathematics. It showcases student project work related to a wide range of engineering and computing topics. These include suspension optimisation for racing cars, vehicle dynamics analysis, a robotic arm capable of human-like movements, aerodynamic analysis, autonomous vehicle control, agent oriented programming, machine learning and game development.

The school also welcomes guests, industry professionals and companies to network with students, who demonstrate the valuable skills they have gained through project work, placements and industry briefs.

This event is open to students and their families, staff and anyone that wants to help celebrate the work of the school.
Tech Show 2018 Business and Public choice awards:

<table>
<thead>
<tr>
<th>Student name</th>
<th>Reason for choice</th>
<th>Business / Public</th>
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<tbody>
<tr>
<td>Jared Reabow</td>
<td>Promising business idea! Retrofitting and customisation is a great combination.</td>
<td>Business</td>
</tr>
<tr>
<td>Jared Reabow</td>
<td>Fantastic idea and made sense to a person who is completely ignorant! Look forward to what he does next. Very clearly interested and passionate about his work.</td>
<td>Business</td>
</tr>
<tr>
<td>Robert Hillman</td>
<td>Harnessing developed technology.</td>
<td>Business</td>
</tr>
<tr>
<td>Spencer Beckman</td>
<td>Creating a more environmentally sustainable product for market.</td>
<td>Business</td>
</tr>
<tr>
<td>David Heath</td>
<td>Knowledge and relevance to composites industry.</td>
<td>Business</td>
</tr>
<tr>
<td>Jared Reabow</td>
<td>Extremely knowledgeable about the project and amazing work – going far! Very interesting and applicable.</td>
<td>Public</td>
</tr>
<tr>
<td>Liam Shackley</td>
<td>Robotics are the future!</td>
<td>Public</td>
</tr>
<tr>
<td>Luke and Jared</td>
<td>Quality, robustness.</td>
<td>Public</td>
</tr>
<tr>
<td>Luke Harris and Jared Reabow</td>
<td>A very original and exciting display.</td>
<td>Public</td>
</tr>
<tr>
<td>Jared Reabow</td>
<td>Technically changeling, well-constructed solution.</td>
<td>Public</td>
</tr>
<tr>
<td>No student name</td>
<td>Pneumatic robotic arm actuation.</td>
<td>Public</td>
</tr>
<tr>
<td>Oliver Hirschfield</td>
<td>Great to have combined the best features of an online PM tool and making it customisation on open source.</td>
<td>Public</td>
</tr>
</tbody>
</table>
The university offers a wealth of different societies you can join, so whatever your interest, there should be a society for it. You can start your own if you find a gap. Here are a few that have interested previous computing students.

**Gaming Society**
The Gaming Society provides the chance for gamers to come together and share their passions. They hold LAN parties and Xbox/PS evenings.

**Computing Society**
Oxford Brookes Computing Society is for both computing students and those just interested in the subject.

**Robotics Society**
The Robotics Society encourages students to discover a new passion for robotics. Our members collaborate on a variety of projects in a friendly, informal environment. This develops technical and team working skills.
Now that you’ve read all about us, do please come and see us. If you’re reading this whilst on a visit, we are very pleased to have you with us.

The best way to experience everything that both the school and the university as a whole has to offer you, is to come to one of our open days. We hold these on Saturdays during October, November and June, from 9am to 4pm. You can visit our Wheatley and Headington campuses to see all the facilities available.

During an open day visit to the school you will be able to attend subject talks and take part in hands-on activities. You can also talk to staff, students and graduates. There will be university staff that can provide information about student accommodation, finance, admissions and any other questions you may have. There are regular campus tours throughout the day at Wheatley and at Headington. You can also tour the student accommodation.

If you are unable to visit us at an open day, we have our digital library on our website where you can watch videos about our courses. You can also book to have a dedicated campus tour at a time that suits you by emailing query@brookes.ac.uk. It’s always best to book a visit as we can’t guarantee that the people you will need to talk to will be available if you visit unannounced.

Applicants who receive an offer of a place on one of our undergraduate courses will be invited to visit us, usually in March, at a dedicated event.

For details of open day dates and how to register, please look on the website at www.brookes.ac.uk.
Postgraduate Programmes
Computing

**MSc/PGDip/PGCert (BCS accredited, partial CITP)**
If your first degree is not in computing and you want to move into IT then our BCS accredited MSc in Computing is designed for you. Our course provides the basis for starting a career in computing and IT, teaching you programming, hardware, networks and software engineering.

Computer Science

**MSc/PGDip/PGCert (BCS accredited, CITPFL, partial CEng)**
Our BCS accredited MSc in Computer Science provides you with a diverse range of skills so that you will be able to produce optimal solutions in complex, multi-discipline projects. This is increasingly widespread in business. The course is aimed at recent graduates with computing degrees, and those with substantial experience in the computing industry, who want to gain a qualification that develops their expertise.

Computer Science for Cyber Security

**MSc/PGDip/PGCert (GCHQ provisional accreditation)**
This programme builds on the knowledge gained in a first degree. We equip you with the advanced computer science and cyber security skills necessary to produce modern secure systems. The theory taught in the lectures is reinforced in the practicals where you have the opportunity to use industry standard tools and techniques in our dedicated security, server and networking laboratories. This provides a safe space for you to practice both offensive and defensive security techniques.

Software Engineering

**MSc/PGDip/PGCert (BCS accredited, CITPFL, partial CEng)**
Our BCS accredited MSc in Software Engineering is designed to produce successful software engineers who will have an understanding of software engineering principles and their application. You will be taught design skills, good management practice, computing science and mathematical formalism. This course will equip you to begin a career or to undertake further study in this important and exciting area.

**DATA ANALYTICS MSc**

With recent developments in digital technology, society has entered the era of ‘Big Data’. In the UK, Big Data has been announced as one of the Government’s eight great technologies with priorities for funding and research. In June 2013, the Government published their “Information Economy Strategy” outlining the pivotal role Big Data will play in rebuilding and strenghtening the economy.

However, the explosion and wealth of available data in a wide range of application domains gives rise to new challenges and opportunities in all areas. One major challenge is how to take advantage of the unprecedented scale of data in order to acquire further insights and knowledge for improving the quality of offered products and services.

This programme has been developed to run alongside the MSc in Data Analytics for Government, which was specified in conjunction with the Office for National Statistics. The MSc in Data Analytics is available to all students, and is not exclusive to any particular employment sector.
Postgraduate Research
The school has an excellent reputation for research and knowledge transfer. We have a number of active computing research groups with internationally recognised researchers in all its disciplines.

The Intelligent Systems Engineering Research Centre (ISERC) operates as an umbrella Research Centre covering the work of the Computer Vision and Artificial Intelligence research groups.

Artificial Intelligence and Vision Research Group
www.brookes.ac.uk(ecm/research/computing/artificial-intelligence-and-vision/)
The group’s research projects span computer vision applications. These include action and gesture recognition and image segmentation, identity recognition from gait and pose estimation, machine learning, with a focus on efficient nearest neighbour classifiers, robotics and autonomous navigation, the modelling of chaos in dynamical systems, uncertainty theory and imprecise probabilities. We focus on the theory of belief functions throughout the course.

Communications, Media and Electronic Technologies Group (COMET)
www.brookes.ac.uk(ecm/research/computing/communications-media-and-electronic-technologies/)
The group works closely together to leverage the different skills available and to cross link ideas. For example, the use of electronics technology in media and acoustics, the use of instrumentation and sensors in wireless networks and immersive media and the application of intelligent network design techniques to wireless systems and to identify innovative solutions.

Cognitive Robotics Group
www.brookes.ac.uk(ecm/research/computing/cognitive-robotics/)
The Cognitive Robotics research group undertakes research into human-robot interaction, autonomous vehicles and bio-inspired robotics. A primary focus of this research is enabling more natural interactions between humans and robots. This theme centres largely around the changing needs of society as we become more reliant on robots and need more intuitive ways of interacting with them.

Cyber Security
www.brookes.ac.uk(ecm/research/computing/cyber-security/)
This research group carries out cutting edge research in the areas of security for safety critical systems and infrastructure. Developing innovative end-to-end security solutions to close the loop of prevention, detection and recovery from security attacks. Such pioneering solutions will help improve the security, resilience and reliability of the critical national infrastructure, safety-critical and cyber-physical / IoT systems, helping to reduce societal and environmental impact of security attacks.

The Dependable Systems Engineering Research Centre (DSERC) is an umbrella Research Centre encompassing the Applied Formal Methods Group, the Applied Software Engineering Research Group and the Advanced Reliable Computer Systems (ARCoS) Group.

Applied Formal Methods
www.brookes.ac.uk(ecm/research/computing/applied-software-engineering/)
The group focuses on applying mathematical theories and methods to a wide range of fundamental problems in software development. This covers requirements analysis and specification, software design, implementation, and testing methodologies, programming, specification and modelling languages.

Applied Software Engineering
www.brookes.ac.uk(ecm/research/computing/applied-software-engineering/)
The Applied Software Engineering Research Group takes an empirical and experimental approach to software engineering, studying software systems in order to characterise and improve the systems. Our work sometimes involves doing interdisciplinary research with psychologists as well as working with other disciplines of computer science such as human computer interaction, artificial intelligence, etc. The group has attracted funding from The Open Group for providing services in the area of enterprise architecture.

Advanced Reliable Computer Systems Group
www.brookes.ac.uk(ecm/research/computing/advanced-reliable-computer-systems/)
The Advanced Reliable Computer Systems (ARCoS) group carries out leading research in the design, test, and verification of reliable computer systems. This includes architectural and systems level VLSI designs, security, power, and process variation aware designs, algebraic modeling of hardware, fault tolerance and testability. Application areas include reliable and efficient systems in submicron and nano technology, attack tolerant crypto hardware for improved security, wearable electronic devices, reliable remote sensors, etc.