uclan
University of Central Lancashire

School of Computing, Engineering and Physical Sciences

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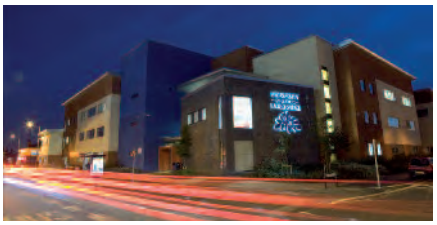
Welcome to the School of Computing, Engineering & Physical Sciences (CEPS)

Whether you are interested in astrophysics or maths, forensic computing or computer games development, robotics or motor sports engineering, we are ready to help you succeed in your chosen subject.

The School offers outstanding laboratories and workshops, top-class teaching, internationally-excellent research and strong links to relevant industries. We focus on the application of learning to real life situations, so we can develop your knowledge whilst enhancing your job prospects.



Computing

During the common first year you can get a real feel for what is involved before deciding how you want to specialise. Teaching emphasises practise over theory; where concepts are introduced in classes, they are demonstrated in practical sessions and students gain understanding by doing it themselves. We include many of the major industry standards or leaders, including Java, Microsoft .NET, Cisco, Flash and Oracle. Specialist computer laboratories enable you to work on professional-standard software and equipment, while the network laboratories enable the students to create real networks. There is excellent placement support, allowing many students to pursue part of their degree studies in industry, learning in a working environment whilst gaining credit towards their final result. All our courses are accredited by the British Computing Society, and those with specialist titles lead to Chartered Engineer status.

Engineering

All our programmes lead to Bachelors of Engineering, and some lead to Masters in Engineering; our approach emphasises the excitement of developing new technology, practical skills and high-level knowledge to enable the design and creation of outstanding products. Our engineering facilities include real working automotive workshops, specialist computer systems laboratories and even a 3D cave! All eligible degrees are accredited by the relevant professional bodies, providing Chartered Engineer status on graduation.

Physics

If you start a Bachelors degree in Physics, Astrophysics or Mathematical Physics, you have the option to switch to Applied Physics or Physics with Astrophysics later in your studies. A common first year allows you to sample each area before making a decision; all the titles offer the option to complete a fourth year to achieve a Master of Physics degree. Teaching underpins theoretical understanding with practical work in our suite of specialist laboratories and Alston Observatory, with options like electronics being studied alongside engineering students. The degrees are accredited by the Institute of Physics and graduates are entitled to become members of the Institute.

Mathematics

Our mathematics programme emphasises mathematic practise and supplements this with modern computational methods, both in exploring the subject and applying it to real problems. Elements of the course are also taught by astrophysicists, computational physicists, computer scientists and engineers - many of whom originally studied mathematics degrees. This ensures the degree remains relevant to the real world while also allowing exploration of this incredible, literally infinite, subject.

The Student Experience

Liam Crabb

Graduate BEng(Hons)
Motor Sports Engineering

"I explored a number of options but was really impressed with the facilities at UCLan, especially the dedicated workshops made available for the course. It provided hands on experience with real race cars and gave us the opportunity to go racing, which was a big attraction. After graduating I worked for a British GT team, both on their GT cars, and also as part of the team when they raced in various European championships. I moved to Grand Prix Masters in September 2005 and was part of the team that built 15 cars in eight weeks for the inaugural race in South Africa. This was very exciting. I am now Lead technician on the GPMx2, two-seater cars, the ultimate passenger ride! I have the ultimate responsibility for the cars at the factory and events."

Dafni Stampouli **Graduate**

"I was attracted to UCLan and the Electronic Engineering course by the excellent facilities and up to date equipment, but I made my mind to study here when previous students talked to me about the dedication and commitment of UCLan staff to actively supporting all students individually."

Jaz Pearson

Prize-winning (2008 National Astronomy Meeting) PhD student specialising in Solar Astrophysics.

"After completing my BSc(Hons) in Mathematics at UCLan, I decided to remain in Preston because the University offers the opportunity to work with European Space Agency (ESA) and NASA solar satellite missions. I have modelled mathematically detailed observations from the Solar and Heliospheric Observatory (or SOHO for short) in order to understand how the outer atmosphere of the Sun is heated by the star's dynamic magnetic field. When I qualify, I hope to be a full-time theoretical researcher in astronomy."

Barney McManners

Graduate BSc(Hons) Computer Games Development 1st Class Honours

"I achieved a first class award, having worked very hard in my final year to pull my grade up from a 2:1. During my studies I represented the course as a liaison to the university, helping give feedback and improve the course as a whole.

"I graduated in 2009 and was offered the first job I applied for, where I still work now, having recently completed my first year in the industry. I am currently in the role of special effects programmer at Eutechnyx, who specialise in driving games and are based in Gateshead.

"I really enjoy my job, and have found that the skills I gained during my course vital in my new role."

UCLan is rated - The Top Modern University in the North West

The Times Good University Guide for 2011

Grow with UCLan

The University of Central Lancashire, or UCLan, is one of Britain's most dynamic and forward thinking higher education institutions.

The School of Computing, Engineering and Physical Sciences provides an exciting environment where you will study courses that have been developed to meet the needs of industry. You will enjoy a "hands-on" learning experience in modern, purpose-built facilities with the support of highly experienced staff. Five major international centres provide opportunities for exciting developmental research and maintain UCLan at the forefront of technology.

Sharing Success

UCLan is a resounding success story within the education sector. Over the last twenty years it has evolved from a small polytechnic to one of the largest universities in the country, employing high calibre staff and attracting students from all backgrounds worldwide. Independent surveys indicate that most UCLan graduates usually secure employment or progress to postgraduate training within six months of graduation.

Superb Library Facilities

The Learning & Information Services (LIS) provides textbooks, study spaces and a wide variety of online resources. UCLan is at the forefront of online support for learning; the majority of modules are supported through dedicated websites (eLearn) enabling online discussion and provision of course materials. There is an extensive wireless network and 24hr access to computers, with more than 2000 PCs across the campus.

City Life

The main campus has flourished into an attractive urban development, central to the city of Preston. Although Preston is a new city, it has a long established history. Situated in the heart of Lancashire, Preston has a population of approximately 134,000. Students arrive here from all over the country; with the International student population this makes it a vibrant and cosmopolitan place to live, with shopping centres, pubs, clubs and eateries only a short walk from the main campus. Nightlife is lively, with prices to make you smile and the award-winning Student Union complex offers everything you'd expect to support your student experience. At UCLan you get the best of both worlds - a positive learning environment based in the centre of a thriving city - so you can realise your potential whilst enjoying the time of your life!

"The eLearn resources were great. The module leader was very approachable and the assignments were very interesting".

Year 2 Software Engineering student

More information about the city can be found from www.preston.gov.uk and www.visitpreston.com

Living at UCLan

An ample supply of modern residences adjacent to the campus means we can offer accommodation to all students who apply. There is something to suit all tastes with University or privately-owned halls, flats and residences, many purpose-built in the last five years. As a new student you will have priority in securing a place in UCLan owned accommodation, where you will be pleasantly surprised by the cost of living in Preston. Our award-winning £6.5m Students' Union building provides enviable facilities including a 1,200 capacity Venue Hall, bars, coffee shop, retail units, advice centre, student job shop and a base for clubs and societies. To find out more about the Union visit www.yourunion.co.uk and for student life in the city visit www.studentstoday.co.uk.

Sport

Sport Opportunities abound at UCLan to study sport, or play sport competitively, to relax or just to keep fit. The Students' Union offers a choice of over 30 sports clubs and if your own sport isn't already catered for, you can start your own club. The Sports Centre, situated at the hub of the Preston Campus, provides state-of-the-art indoor sports facilities for badminton, basketball, volleyball, netball, short tennis, 5-a-side football, fencing, tennis, yoga, table tennis, martial arts, a wide range of fitness classes including aerobics, step, body-max and combat aerobics, and weight training equipment.

The new multi-storey sports centre offers even better facilities, reinforcing the University's commitment to sport already shown at the £12m UCLan Sports Arena, which is one of the best multi-sports sites in the North West, offering:

- 7 grass football pitches
- a floodlit, Premiership quality Grass Master Desso football pitch
- 3 grass rugby pitches
- an 8 lane, International standard floodlit athletics track
- a sand fibre indoor training facility
- 6 five-a-side all weather grids (enclosed area)
- a seven-a-side all weather grid (enclosed area)
- 2 full size all weather hockey and football pitches
- 4 tennis/netball floodlit courts
- a cricket pitch
- 2 cricket nets
- a cycle circuit (1.5km)
- a multi-purpose meeting activity room
- an eighteen piece fitness suite, with the latest equipment
- a meeting room
- an activity room
- numerous classes from Aerobics to Yoga

The standard of the Sports Arena is so high it has been selected as a Pre-Games Training Camp for the London 2012 Olympics.

uclanSPORT

Electronic & Computer Engineering

We all use microprocessors many times daily, not only in personal computers, but also in products as diverse as cars, mobile phones, digital cameras, MP3 players, DVD recorders, washing machines, games systems… the list is endless.

The Electronic and Computer Engineering (ECE) area offers courses directly relevant to modern industry and designed to prepare you for a career in a wide range of key areas of electronics and technology. You will study various technical areas such as digital systems, signal and image processing, computer vision, and robotics. You will be able to tailor your selected course by choosing from a large range of option modules and working on a Project in your area of interest.

Practical skills will be developed by working with real electronic systems ranging from automotive electronics through to robotics and sophisticated signal and image processing systems. You will quickly move from working with our existing systems into the design and implementation of your own electronic systems in automotive electronics, medical electronics, robotics, or sports related systems supplied by a dedicated team of academic staff.

Electronic and Computer Engineering Courses

BEng(Hons) Electronic Engineering
UCAS Code: H610 BEng/EE

BEng(Hons) Robotics and Mechatronics
UCAS Code: HH36 BEng/RM

BEng(Hons) Computer Engineering
UCAS Code: GH56 BEng/CEng

BEng(Hons) Digital Communication
UCAS Code: H640 BEng/DC

BEng(Hons) Digital Signal & Image Processing
UCAS Code: H690 BEng/DSI

BEng Electronic Engineering (Foundation Entry)
UCAS Code: H608 BEng/EEF

BEng(Hons) Electronic Design Automation
UCAS Code: H691 BEng/EDA

Mike Clarke graduated with a first class honours degree In Electronic Engineering in 2006.

"I realised that gaining a strong degree in Electronic Engineering would enable me to enter the aviation industry at a technical level. I was immediately struck by the high level of care and planning that is obviously spent designing the Electronic and Computer Engineering courses. There was never any doubt in my mind that UCLan was the university for me. Six weeks after graduation I was offered a role at BAE Systems as a Flight Systems Engineer."

Professional Accreditation

All BEng(Hons) courses in Electronic & Computer Engineering are accredited by the Institution of Engineering and Technology (IET). A 2(ii) or higher degree counts towards professional registration as a Chartered Engineer (CEng). All students are encouraged to join the IET and to participate in IET activities; on graduation you will be eligible to join the IET as a full member.

Specialist Laboratories

We have a range of excellent state-of-the-art practical facilities available to you as an ECE student, including:

Digital Signal Processing (DSP) and Embedded Systems Laboratory

Robotics and Vision Laboratory

3-D Visualisation Laboratory

Physics & Astrophysics

These courses will develop your investigative, experimental, mathematical and computational abilities. You will understand the fundamentals of our Universe, from quarks and neutrinos upwards. You will develop skills in systematic and intelligent experiment and analysis, to become a well-rounded physicist who is equally at home in a research team or in industrial environments.

Astrophysics is also one of the most exciting subjects going, where you gain an insight to the workings of some of the most extreme environments known to man. You will learn to apply other numerate sciences to astrophysical problems. Upon graduating you will have transferable skills ranging from a deep understanding of fundamental scientific laws to mathematical and numerical modelling techniques.

Alston Observatory - second to none!

Our unique astronomical observatory provides experimental facilities for courses in Astronomy and Astrophysics. Alston Observatory is one of the largest teaching observatories in Britain.

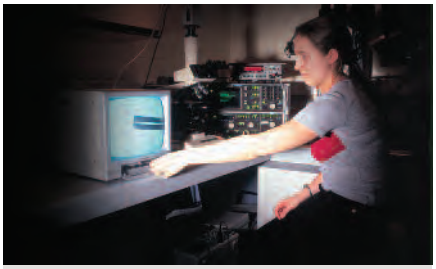
Distance learning

We offer a world-leading programme in Astronomy by Distance Learning via our Study Astronomy brand (www.studyastronomy.com)

Physics Courses

MPhys/BSc(Hons) Astrophysics
UCAS Code: F521

MPhys/BSc(Hons) Physics
UCAS Code: F303



'The job entails lots of hands on instrumentation, the use of IT both for the analysis of data, and for report writing and giving presentations, all aspects of which were covered in my degree course at the University'. **Heather Pegrum**

Heather graduated from UCLan with an MPhys in Physics and Astronomy and then joined the Optical Radiation team at the National Physical Laboratory (NPL) in Middlesex. NPL is the United Kingdom's national standards laboratory, an internationally respected and independent centre of excellence for research, development and knowledge transfer in measurement and materials science.

Professional Accreditation

Our Physics and Astrophysics degree courses lead to the conferment of Associate Member of the Institute of Physics (AMInstP). This is the first step towards full corporate membership of the IoP.

Facilities

All students on the course have access to specialist laboratories for nuclear physics, optics and spectroscopy, image processing, microcomputer interfacing and laser physics, as well as a projects laboratory. These are equipped to a very high standard with items such as nuclear instrumentation for gamma-ray spectroscopy, computer-aided design, computer based image processing and holography. Physics at UCLan has a leading position in research-informed teaching. A newly installed state-of-the-art undergraduate research laboratory in Computational Physics allows students to enjoy the experience of being at the forefront of modern science and to conduct a project, which may be published in leading international journals. Dr Robert Walsh has been awarded the prestigious title of Scientist for the New Century by The Royal Institution of Great Britain.

Careers

A wide range of career options are available to the graduate in physics and/or astronomy. Graduates find employment in industry and the Civil Service as scientists and technicians in technical sales or technical journalism. On average 40% of our graduates go on to Masters courses or to PhD research.

Mathematics

In our increasingly complicated world it is mathematics that is evermore used as a way to describe and study it. It is the way by which we try to understand, describe and (hopefully) solve problems. Mathematics is the backbone of science and technology; however it is also used in many other areas.

One great asset of studying mathematics is that it develops your logical thinking. This enables you to "look at" almost any sort of problematic situation and get to the crux of the problem. This is one of the main reasons mathematics graduates are so sought after in a huge variety of employment situations. Quite often mathematics graduates are not employed for the actual mathematics they have learnt but for their ability to think and analyse logically.

"If you keep wanting to know 'why' does it work, then you have the right type of inquisitive mind that is required to be a mathematician."

Kevin Bowman Mathematics Course Leader

Mathematics Courses

BSc(Hons) Mathematics
UCAS Code: G100

The mathematics degree encompasses the ideas, concepts, methods and uses of mathematics. You will get to know not only how to do things but also understand why they work. A large variety of types of situations are considered from "how to send secret messages" to "predicting if a species will survive" to "how to look inside a brain using x-rays" (which are examples of using "number theory", "differential equations" and "linear algebra"). Some aspects of mathematics can exploit the use of the computer and so you will be introduced to using this useful and versatile tool as we develop your confidence and knowledge base of techniques involving the computer.

Careers in Mathematics

There really is no "typical job" that mathematics graduates proceed on to. However, a mathematician's logical, problem-solving and numerical skills are highly sought after in many different areas of employment. For example, this can range from positions in industry through to the financial sector as well as in teaching. These fields are by no means the only routes that can be taken after a degree in maths. In fact, you'd be surprised at the great diversity of jobs that are open following this degree; from developing computer games to studying climate change; from industrial project management to working with a Formula One racing team on aerodynamics; from running massive parallel supercomputing simulations to tracking and analysing the buying habits of supermarket shoppers.

Computing Courses

BSc(Hons) Computing
UCAS Code: G400

BSc(Hons) Information Systems Design
UCAS Code: G540

FdSc Computing
UCAS Code: G402

Professional Accreditation

On successful completion of any of the named undergraduate Honours degrees (except for the general route - BSc (Hons) Computing), you will be eligible for MBCS together with initial CITP and partial CEng accreditation.

Computing

Phidgets (physical widgets) are simple electronic components that can be used to form interactive tangible systems. The components include a variety of sensors such as touch sensors, light sensors and RFID readers, sliders and joystick inputs, plus motors and LED output arrays, and these can be controlled using a wide choice of programming languages. They provide an excellent means of creating interactive physical interfaces in a simple and understandable manner. Students have used them in many of their projects, to quickly prototype interactive interfaces, to build games with physical controls, and to learn more about the challenges and benefits of tangible interaction.

Computing Career Options

Technical information system designer

Skilled database developer

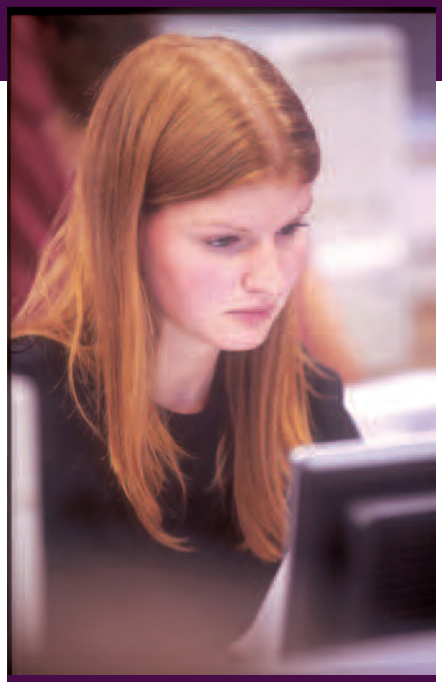
Information Analyst

IT Systems

UCLan Systems courses lead to excellent career prospects in the management of information systems relied upon in modern organisations.

Our Information Systems Design courses provide you with the opportunity to study a core first year with the option to then undertake a variety of modules in your second year. These include Technical Solutions and Business and Agile Systems Development, which focus on the context of IT in commerce and the development of flexible commercial systems.

Our Systems courses are very flexible programmes which allow you a great deal of choice in selecting technical specialisms. The courses discuss modern computing management, techniques to analyse and model information systems and how information technology can be introduced to benefit the business. They further give important transferable people and employability skills and do not require programming as part of the area of study.



Multimedia Courses

BSc(Hons) Multimedia Development
UCAS Code: G450

FdSc Computing (Multimedia)
UCAS Code: G453

Microsoft Surface

Multimedia

The multimedia courses offer you the chance to develop a range of skills using industry standard software and equipment. The first year modules look at the types of media and their creation focusing on youth entertainment including podcasting, games and YouTube.

You will learn the theoretical underpinning and develop skills in Flash programming to enable you to build interactive games and animations.

You will also learn how to manipulate and edit both static Images and video content for DVD or the internet. A range of hardware devices support the modules including Wacom tablets, video cameras and digital cameras.

On completing the degree you will be equipped to work in a variety of roles within the multimedia industry, from creating online games to developing CD-Roms or web applications.

HCI Specialist Labs

HCI Usability Lab

This facility is for student usability studies as well as for commercial work. The lab comprises a soundproof space with two way mirrors that can be used in observations of typical computer use. Three video cameras, a microphone, and screen capture software record all the activities that are carried out. Eye-tracking and gaze-tracking software allows the researcher to 'model' an interactive space and track where the user is looking.

The PlayLab

This large space is primarily used for interactive activities with children and teenagers. It has networked and stand alone PCs, an interactive SmartBoard, a set of slate tablet PCs and digital pen technologies.

Microsoft Surface

This is a new and exciting piece of technology which is essentially a table with a large interactive touch-sensitive screen built into the surface. Unlike usual touch-screens a Microsoft Surface can monitor and respond to over 50 individual touch points

simultaneously and allows interaction using a variety of touch gestures and can recognise the position and orientation of objects placed on it. It allows a group of people gathered around the technology to interact with the same application simultaneously (without the need for mice and keyboards) while still being able to communicate face to face. The Microsoft Surface at UCLan is one of only a small number of such devices in the UK.

Software Engineering and Computer Games

A software engineer must understand customer requirements, design a solution, implement the design in appropriate programming languages, test the implementation for robustness and evaluate its efficiency and usability. Technical skills must be supported by expertise in project management, quality assurance, and legal and ethical issues.

"Whilst on placement, I was an 'Undergraduate Software Engineer' involved in maintaining and upgrading / adding functionality to display software used for signs etc. at train stations round the country. Now I'm a 'Software Engineer' working on releases of new software used to monitor and control assets (displays, PA, CCTV, Network equipment etc) at London Underground sites (specifically Tube lines sites i.e. Northern, Jubilee and Piccadilly lines) and the specification, design and development of a central management system for these sites."

Claire Walsh

Graduates

Christopher Bunner graduated in 2009 with a first class honours degree. His final year project brought in a number of contemporary real-time visual effects in order to create a realistic looking alley way in the rain, for example, the scene is reflected in the puddles on the floor but in a distorted fashion because of the ripples caused by the rain drops.

After graduation, Christopher joined Blitz Studios as "Senior Special Effect Developer". Joining him as a special effect programmer at Blitz that year was Lorna Cooper. She also graduated in 2009 with a first class honours degree.

Careers in Games

The Computer Games Development course has a proven track record of graduate entry into the games industry. We have had graduates going to Evolution Studios, Blade Interactive, Bizarre Creations, Juice, Steel Monkeys and Embryonic Studios, amongst others.

Studying at UCLan

Our degree mirrors industry needs and composition. We specialise in the training of programmers for the games industry, following the guidelines of the International Games Developers Association (IGDA).

The main programming language you will study on the course is C++. Programming with C++ starts in year one of the course. The main graphics approach Is DirectX. An understanding of shaders is essential to the graphics part of any modern computer graphics degree. Shader programming is introduced in year two of the degree.

Working in the JAD lab was great fun. There was a relaxed informal, informative teaching approach. The use of eLearn was good. Fast turnaround of assignments.

Year 2 student

Computer Games and Software Engineering Courses

BSc(Hons) Computer Games Development
UCAS Code: G451

BSc(Hons) Software Engineering
UCAS Code: G600

BSc(Hons) Computer Games Development explores the implementation of computer graphics, artificial intelligence, game logic and mechanics to produce exciting games. The ability to develop highly interactive and complex real-time programs is an excellent preparation for many careers in computing.

Networks and Forensic Computing

One of the biggest growth areas in computing is in networks and forensic computing. Networking skills include the design, implementation and management of wired and wireless networks; setting up and maintaining secure networks within an organisation and across the internet. Forensic skills include extracting concealed evidence from a computer, PDA or mobile phone; reconstructing the actions of a user from the digital evidence and learning how to present forensic evidence in court.

An exciting new area is the design and development of applications for emerging mobile integrated devices such as phones that incorporate camera, MP3 player, computer and games console. The integration of these media technologies will allow a whole new generation of, as yet unthought of, applications to be developed. We have one of the first courses in the UK specifically designed to enable you to develop these applications.

Career Prospects

On our courses you will have the opportunity to set up secure wireless networks, understand the technology and work with the latest standards. We incorporate the very latest hardware and software technology in our specialist Networks and Forensic Computing laboratories. You will study the Cisco CCNA academy vocational qualification and the HP Openview vocational qualification. CCNA is very widely known and a requirement in many network job adverts. Openview is one of the most widely used corporate network management systems (in use). It is delivered by HP's main distributor in the UK in a unique relationship with UCLan. Students who pass the Openview qualification may be recruited by the distributor as Openview consultants upon graduation. Getting one of our Networks or Forensic Computing degrees and vocational qualifications gives you good employment prospects, career progression and earning potential.

"I was lucky enough to secure a placement with CY4OR Ltd, a specialist computer forensics company, with its head office based in Bury. CY4OR have involved me in every aspect of their business, from collecting and imaging evidence to offering advice in various different areas, managing technical support, administering the networks and working on cases. I have also received training from major forensic companies and industry experts and even specialist expert witness training as well as attending forensic conferences." **Oliver Smith**

Networks and Forensic Computing Courses

BSc(Hons) Computer Network Technology
UCAS Code: G611

BSc(Hons) Forensic Computing
UCAS Code: GF44

FdSc Computing (Networking)
UCAS Code: G423

Computer Networks Laboratory

Our Networking Laboratory is fully equipped with a wide range of wired and wireless networking equipment. We have a rack of Cisco routers and switches to enable you to configure a wide range of large scale wired and wireless networks. These are used extensively as part of the Cisco CCNA academy course for which we are an approved provider.

Forensics Laboratory

The specialist forensic lab within the School is equipped with networked computers, each with the latest version of Guidance Software's version of EnCase. Using EnCase, students can investigate every "hiding hole" imaginable on a range of digital media. The rapid growth in popularity of personal digital devices, such as mobile phones and PDAs means that the forensic investigator's experience cannot be limited to computers. Digital Forensics have grown in importance in recent years, while there has been increasing awareness of home PC security, the criminals are making many opportunities to exploit unsuspecting victims in a variety of novel ways. Many home users have heard of "phishing", "viruses", "spam" and a whole variety of different "cyber crimes"; however digital evidence is used increasingly in traditional criminal investigations such as kidnapping, murder, and stalking.

UCLan Racing, the University of Central Lancashire's race team run by foundation and first year motor sports degree students, returned from the final race of the season as 2010 champions. Competing in the Avon Tyres Formula Ford 1600cc Pre 90 Northern Championship, they led the way from the first race of the season until the last. Their championship winning driver, John Farrell, amassed six race victories during the season.

Alumni of UCLan Racing can now be found in almost all areas of international Motor Sport engineering, and the experience they have gained here at UCLan is a big part of their employment success.

Motor Sports and Computer Aided Engineering

Studying with us, you will have many opportunities to enrich your studies with practical activities outside the formal taught course. Our students conceive, design and manufacture their own Formula Student Car for competition with novel design features. We run a Formula Ford 1600 racing team in the North West FF Championship that is entirely staffed by our students, and is very successful. Students have in the past found themselves pro-karting, "spannering" for racing teams, building race engines, and building a turbocharged Honda CBR600 for the Maccau Grand Prix. They even helped a lecturer build a Formula 3 Hovercraft which won the UK Championship and competed in the World Championship. Second year students are invited to join successful sports racing car manufacturer Juno Racing in their time outside lectures, and get involved in the manufacture and race support of these impressive cars. Juno cars currently compete in Britsports and the "V de V" championship in Europe. It's a lot of hard work, but looks good on your CV!

"I chose UCLan for the opportunity to progress my career after being a race car mechanic for some time. After graduating I was re-employed by my year in industry employer (Garrett Engine Boosting Systems) for 18 months. I then went to work for Scania Trucks in Stockholm, Sweden, where I am employed as a Turbocharger Consultant/Test Engineer."

Matt Besent
BEng (Hons) Motor Sports Engineering graduate

Motor Sports and Computer Aided Engineering Courses

MEng(Hons) Motor Sports Engineering
Full-time UCAS Code: H334
Sandwich UCAS Code: H339

BEng(Hons) Motor Sports Engineering
Full-time UCAS Code: 331

MEng(Hons) Computer Aided Engineering
UCAS Code: H133

BEng(Hons) Computer Aided Engineering
UCAS Code: H132

BSc(Hons) Motor Sports
UCAS Code: H330

BSc Motor Sports (Foundation Entry)
UCAS Code: H336

Motor Sports Foundation Entry
Not got the right A-levels? Our one-year foundation entry course can help. We will give you support in maths, science and all sorts of study skills, so that you can attack the first year "head-on".

CAE

Computer Aided Engineering can help you embrace remarkable new technologies. It's not just CAD/CAM anymore; the latest developments are in simulation, Computer Aided Testing and Finite Element Analysis. We'll not just teach you how to use "state of the art" software packages; we will encourage you to be creative and practical in your use of them. The Motor Sports courses culminate in the design and manufacture of a new car from the ground up, and we'll make sure you're ready for the challenge.

Facilities

Our students have manufactured many complete racing cars from scratch. We have a large race-car workshop, a motorcycle workshop, and dynamometer test facilities.

Industrial placements

Around 40% of our students choose to spend a year on industrial placement and establish contacts that get them their first job. Placement companies have included Alcon, Bentley, Bold Engineering, Honeywell (Garrett Turbos), Medina Sport, Xero, and Xtrac."

"The teaching style of the staff on the program at UCLan helps join the practical and the theoretical while gaining experience. I have learnt how to fabricate and machine using the abundant machinery and tools. The Motor Sports Club also gave me the opportunity to use these practical skills while keeping the theoretical in mind. I was able to put new found skills to the test at the Le Mans 24 hr bike race."

Kevin O'Loughlin
BEng(Hons) Motor Sports Engineering

"Before studying at UCLan I had never been to a race track, or laid a spanner on a race car, and now I am working with former F1 World Champions! When you graduate not only do you have a degree, but also years of experience in the industry. The lecturers have relevant experience in motor sport, and they bring with them not only knowledge but their connections throughout the industry. They are also very easy to approach and provide support whenever it's required."

Liam Crabb graduate BEng(Hons) Motor Sports Engineering

Skills for life

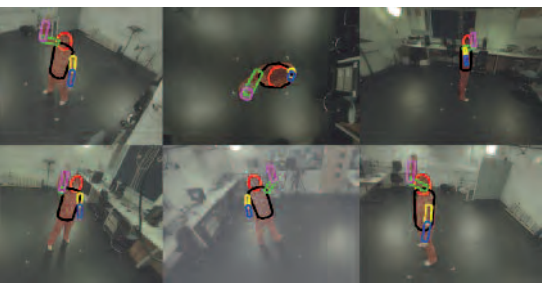
Engineering develops good problem solving abilities and organisational skills. Career prospects are not confined to Motor Sport, or even engineering. We have graduates working in fields as diverse as aerospace and finance. Our Motor Sports Engineering and Computer-Aided Engineering courses have received accreditation for chartered engineering status by two professional institutions: the Institution of Mechanical Engineers **(IMechE)** and the Institution of Engineering Designers **(IED)**.

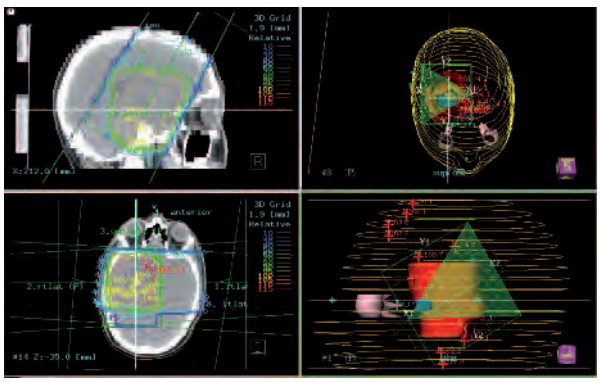
Taught Masters

MSc/PGDip Computing is the most flexible where you can choose modules that interest you the most. MSc/PGDip Network Computing is a blend of practical and theoretical work that concentrates on wired and wireless networks from both a hardware and software perspective.

MSc/PGDip Database Systems benefits from the inclusion of Oracle Academic Initiative courseware, this can offer you opportunities to become an Oracle accredited professional.

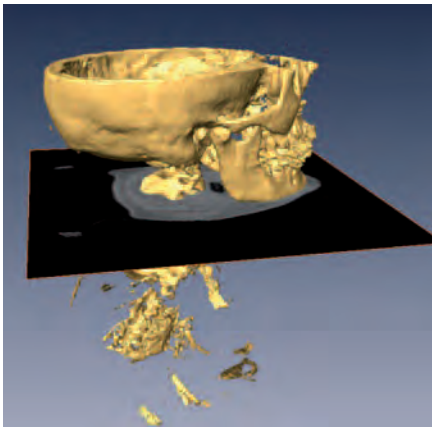
MSc/PGDip Agile Software Projects is the first course of its kind in the country. It is a user focused approach for practising software developers, to support the move from traditional to agile development methods, enhancing commercial capabilities and personal performance.





MSc/PGDip Digital Signal and Image Processing techniques are used in a wide variety of modern electronic and information systems, in application areas such as communications, computer systems, avionics, robotics, remote sensing, industrial inspection, medical imaging and many more. The rapid development in the provision and use of these systems has created the requirement for engineers with the theoretical knowledge and design skills to develop and research new advanced systems and techniques.

MSc Renewable Energy Engineering is designed to help you develop knowledge and practical skills that you can apply to assist a wide range of renewable energy industries. It will use dedicated lab and field-testing facilities for measuring and monitoring performance of different renewable energy systems such as wind turbines, photovoltaic power systems and heat pumps, besides using tools for system design/modelling and simulation of power performance of different renewable energy systems.



MSc Wind Energy Engineering combines engineering and technology, system design/analysis and operation, project development and implementation; which enable you to tackle a variety of engineering and technical issues in wind energy projects.

To see the full range of MSc courses please turn to the back cover or visit the School website

Excellence in Research

The breadth of research within CEPS is unparalleled. From the sub-atomic, to the vast expanses of the Universe, our staff and students continue to push the envelope of modern computing, engineering, physics and applied mathematics research.

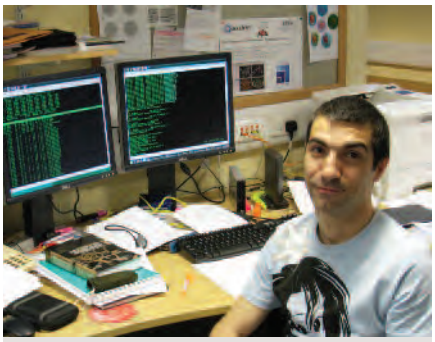
The engagement of undergraduates and postgraduates in our international research programmes ensures unique and personal training opportunities across a range of applied and fundamental scientific, technological and computational fields.

Whether it is a career in academic research, or one in the industrial or business sectors, these research opportunities provide invaluable skills towards making our graduates amongst the most marketable in the North West.

The **Jeremiah Horrocks Institute** embraces our recognised nationally excellent work in astronomy, astrophysics and soft matter physics. JHI research is a major user of UCLan's High Performance Computational (HPC) facilities, and is a Core Partner in Stephen Hawking's COSMOS Consortium – the UK's National Supercomputer for Cosmology. Our HPC research in astrophysics includes the formation and evolution of galaxies and large-scale structure throughout the Universe, the disruption of stellar clusters in the vicinity of supermassive black holes, and the origin of coronal mass ejections from the surface of the Sun. The JHI Soft Matter Physics Group focuses on nano-structure soft materials and biologically-inspired materials, with a specific interest in understanding the fundamental physics of self-assembly of such materials, which will lead to the design of materials of the future. This work has international reach, with collaborations with institutes such as the University of Leiden where complimentary world-leading experimental work is taking place.

The JHI's research portfolio extends beyond the HPC arena, with its rich history in observational astrophysics. The JHI is the leader of the UK Southern African Large Telescope (SALT) consortium.

This provides preferential access to the facilities at the South African Astronomical Observatory, one of the best astronomical observing sites in the world. We also make routine use of numerous world-leading astronomy facilities, including telescopes in space such as NASA's Kepler mission and solar physics facilities such as Solar Heliospheric Observatory and Solar Dynamic Orbiter. Our scientific expertise includes exploration of the oldest galaxies in the Universe, in order to understand their formation and evolutionary history, observations at the interface between solar and terrestrial physics, asteroseismology of the interiors of nearby stars, stellar explosions, and an intensive effort to probe the effects of dust upon the energy budget of galaxies and the Universe itself.



Dr. Marco Pinna beat off competition from Doctoral students from all over the UK and the Republic of Ireland to be given the annual thesis prize from the Institute of Physics Computational Physics Group. Marco, whose expertise is in using supercomputers for discovering laws of the nano-world has now published his PhD thesis as a book titled "Mesoscale modelling of block copolymer systems: a computational study".

Marco currently works at UCLan as a Research Associate in the Computational Physics Group on an EU project involving five universities from four countries; the UK, Holland, Germany and Israel. The project focuses on creating inexpensive memory devices that can be as flexible as a postage stamp.

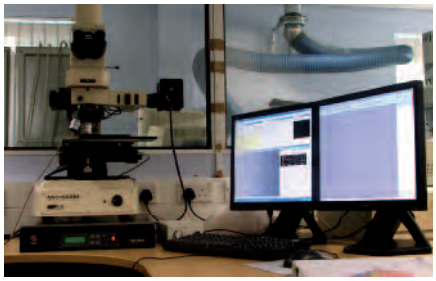
Jost Institute for Tribotechnology

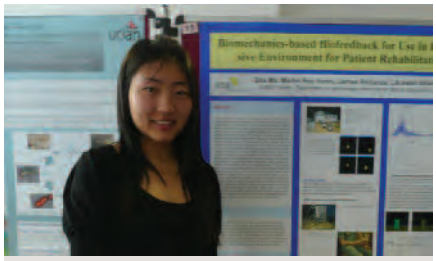
Tribology is the study of interacting surfaces in relative motion and involves lubrication, friction and wear. The Jost Institute for Tribotechnology provides a centre of excellence for industrially relevant research, teaching and knowledge transfer within this area. Research interests predominantly include: Fluid Film Technology, Tribometry, Surface engineering and Tribology in Extreme Environments. Projects focus on aerospace engineering, automotive engineering and manufacturing processes. Research partners include: Shell Global Solutions, Goodrich Aerospace, the European Space Tribology Laboratory, University of Leeds, the Royal Institute of Technology in Stockholm (Sweden), the Technical Research Centre of Finland (VTT), Luleå University of Technology (Sweden) and Kyushu Sangyo University (Japan).

The National Skills Academy NUCLEAR

Picture courtesy of Sellafield/Nexia.

adsip APPLIED DIGITAL SIGNAL AND IMAGE PROCESSING RESEARCH CENTRE





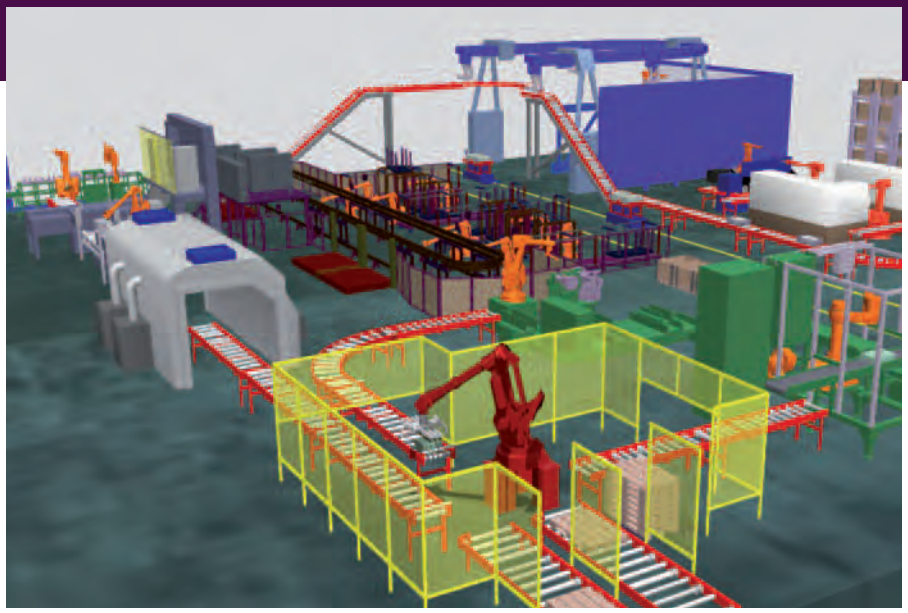
Sha Ma – MPhil/PhD in Development and Evaluation of an Electromyography Biofeedback based Virtual reality System for Hand Motion Rehabilitation.

Sha Ma has just completed her PhD in Digital Signal Image Processing from the School of Computing Engineering and Physical Sciences. Her research was focused on developing an interactive training environment for muscle control and rehabilitation for individuals having upper limb movement problems e.g. people with cerebral palsy and stroke victims.

The John Tyndall Nuclear Research Institute (JTI), developed out of UCLan's Centre for Materials Science (CMS), has been recognised for its national research excellence. JTI staff and students study the modelling, creation, processing, characterisation and use of both functional and structural materials using techniques and concepts traditionally associated with Physics, Chemistry, Biology and Engineering. Work is thus inherently interdisciplinary. UCLan staff collaborate closely with the Nuclear Industry, mainly on projects in the areas of Advanced Fuel Cycle Process Development; Sensors and Analysis; and Waste Minimisation and Management. The JTI has moved onto new research areas relating to ventilation engineering, the treatment of contaminated land and related safety issues. It is also developing an expertise in the applications of interfacial science in efficient decontamination of surfaces during the decommissioning process.

ADSIP (Applied Digital Signal and Image Processing) Research Centre collaborates with over 100 establishments worldwide and is the first winner of the NWAA/Sir Frank Whittle "University of the Year" sponsored by Rolls-Royce. The Centre is well known in Europe for its expertise in the development and deployment of highly sophisticated and innovative data processing techniques in aerospace non-destructive testing (NDT), medical diagnosis/treatment, remote sensing, and radiation effects on electronics. ADSIP is supported by modern laboratories equipped with a wide range of the state-of-the-art hardware and software systems for digital data capture, real-time processing, as well as immersive and interactive visualisation.

Centre for Advanced Digital Manufacturing Technology is a new centre created by the University to engage in digital manufacturing research and innovation to enable companies in the region to become the most competitive and dynamic knowledge-based manufacturers in the world. By cross-sector collaboration (aerospace, medical and nuclear sectors), and multi-technology integration (digital, material, nano and tribo technologies), it provides a unique, comprehensive, industry-driven and interdisciplinary research environment. In addition to specialist laboratories shared with the ADSIP Research Centre, it has a large manufacturing workshop with a wide range of reverse engineering facilities such as CMM, laser scanners, equipment for material, surface and integrity testing, and rapid manufacturing facilities such as CNC machining, composite fabrication, investment casting and rapid prototyping machine.



Child Computer Interaction

Our **Child Computer Interaction (ChiCI) group** is one of the few research clusters working in this specialised domain. Focussing on the usability, and therefore the design and evaluation, of interactive technology for children, the group engages in a wide variety of projects for children including text input, digital ink applications, recognition technologies, mobile device usage, tangible technologies, robot interaction, ubiquitous systems and table top and surface applications.

Themes across the work include error handling, evaluation methods for use with children (especially the highly regarded Fun Toolkit) and participatory and informant design with children. Recently, the work of the group has extended to work with teenagers and a theme in this area is the engagement of disaffected youth in design and evaluation activities.

Working with more than 100 collaborating establishments worldwide, the ChiCI group has an excellent has an excellent research record and presents work at international conferences.

The **Wind Energy Engineering Research Group** is committed to provide research and education excellence and knowledge transfer in wind energy engineering. Established in early 2008, UCLan's research into wind energy has experienced sustained growth, achieved by our professional expertise, innovative technology and in collaboration with industry worldwide. The group conducts research in diverse aspects of wind engineering including turbine blade design and manufacturing, 3D aerodynamic analysis, turbine control and structural health monitoring, lubrication and wear of turbine bearings and gears and other smart applications of renewable energy.

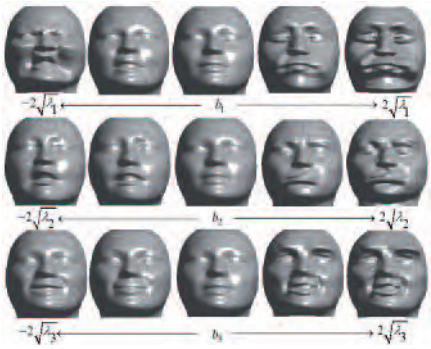
Research Laboratories

Digital Signal Processing (DSP) and Embedded Systems Laboratory supported by the world leader in DSP technology, Texas Instruments. "It is great to see one of Europe's youngest Universities demonstrating world-class research in this field. The challenge is now to impart these skills to as many of their Electronics graduates as possible," said Robert Owen, TI's European University Programme Manager.

Robotics and Vision Laboratory, supported by Paccar, a world leader in truck manufacturing technology. This facility will allow you to experience the latest developments including dynamic 3-D photography, high-speed multiple view image capture, SpheroCam (panoramic image capture system), miniature cooperative roots e.g. use in robosoccer games, multi-axis robotic arms and mobile multi-purpose robotic platforms.

3-D Visualisation Laboratory supported by EON Reality. This unique facility includes a multi-screen configurable stereoscopic display with wireless tracking, and enables you to immerse yourself in, and interact with, digital environments and virtual realities. Students have used this facility to develop immersive dynamic 3-D models of complex objects such as spacecraft.

Non-destructive Testing Laboratory supported by BAe Systems, a world leading aerospace company. It is equipped with measurement systems based on acoustic emission, acoustography, ultrasound and phased-array ultrasound as well as a good collection of defect specific components.



The Advanced Manufacturing Laboratory at our Burnley Campus features a SAP installation of their software for automated factories. This facility allows local business, small, medium or large, to test out new approaches to data management and its application to the manufacturing process. Final year students are able to carry out project work using this facility that can emulate a much larger manufacturing facility of the sort used worldwide.

The Child Computer Interaction (ChiCI) Laboratory is specifically set up for use with primary school aged children. Students can use the lab to carry out activities including design sessions, evaluations, and prototyping with an age group not normally accessible within the university environment, supported by one of the World leading research groups in this area.

The Interaction Design and People Centred Computing (IDPCC) Laboratory contains a two way mirrored observation room allowing recorded evaluations to be carried out with subjects and equipment. It is currently home to our £10,000 Microsoft Surface, one of only a few Surfaces available for development and evaluation by students in the north of England.

Working with Industry

How does it work?

Academic staff work with a range of businesses and industries in a wide variety of ways. For example, staff from CEPS do everything from deliver specialist training courses, act as consultants or expert witnesses to advising on specialist digital or engineering equipment.

Why bother?

It's very much a two way process. Staff from CEPS are able to share their research findings and expertise with industry to ensure UK organisations stay at the forefront of their field. Whilst industry provides the problems and arena for academics to study.

What does it mean for students?

Often students don't see the link between teaching and industry based research but each is vital to the other leading to many direct benefits to students.

- **Industry based research ensures your lecturers are up to date with relevant and current knowledge.**
- **Lecturers who research are not just able to talk about theory but often help to develop, shape and prove the theories they teach.**
- **Close links with industry means lecturers know exactly what employers are looking for and can make sure our students have those skills**

Energy Management - Partnership with BAe Systems

The university has signed a £1 million three-year partnership with BAe Systems to conduct research into energy management. The project, led by the university's Centre of Sustainable Development (CSD) will help the defence giant manage its energy supplies by cutting emissions, reducing costs and securing supplies. Research will focus on the development of intelligent energy management systems for use in the defence sector, initially on BAe Systems sites across the UK but with potential for wider use both in the defence industry and on military bases.

Nigel Whitehead, Group Managing Director, Programmes & Support at BAe Systems, said: "Environmental issues are a growing concern for the military and the defence industry. Our partnership with UCLan will show how engineers can tackle these issues and is part of a wider energy management strategy at BAe Systems."

The **Wind Energy Engineering Research Group** in CEPS is currently working with different SMEs in the region wishing to utilise small wind turbines and the wind turbine manufacturing, installation and maintenance supply chain.

The project titled 'The Development of Innovative Small Wind Turbine Technologies (IsWindTech)' is funded by the European Regional Development Fund (ERDF), addresses the need to provide site-specific small wind turbines which incorporate innovative design and new materials of construction leading to better performance.

Collaboration with Sony Computer Entertainment

Recently, the School has been undertaking a collaborative work with Sony Computer Entertainment (SCE) in the area of stereoscopic 3D for Computer Games Development. Following a significant investment by the university and with the aid of computer equipment provided by SCE, a new laboratory has been set up for 3D Games Research. The group is currently conducting various experiments for a comparative study of 2D vs 3D Games and will focus on joint industry-related research in the areas of games development, immersive and interactive visualisation and 3Dhardware and animation. The research facility is being extended to the current undergraduate students and the School is exploring opportunities to develop and deliver course content in consultation with SCE.

DVice to help Young Offenders

Staff in the School have worked closely with members of the Lancashire Youth Offending Team to develop an Internet based tool to help reduce re-offending rates in young people locally. The product is now being made available to other Youth Offending Teams around the UK.

Partnership perfection

UCLan Knowledge Transfer Partnership Associate Hareesh Kallambella has won the prestigious Business Leader of Tomorrow Award. He was chosen from over 1000 KTP associates and was presented with the award at the KTP Awards ceremony in London. The Knowledge Transfer Partnership scheme is Europe's leading programme helping businesses to improve their productivity by funding graduate work placements. Hareesh was employed by UCLan to take up a KTP associate position with Jones Stroud Insulations Ltd (JSI) in Longridge, Preston, and was given the task of spearheading the company's ambitious improvement plans. With full support from UCLan and JSI, Hareesh implemented new methodologies for product and process improvement and proved to be a key success factor and invaluable asset to the company.

How to apply through UCAS

UCAS has a secure online application system, called Apply, designed not only for students applying at school and college, but also for independent applicants (UK and international). Go to www.ucas.com and click on Apply.

See for yourself

Open Days & Campus Tours

The best way to find out about a place is to go on a visit and have a look for yourself. No matter what other people say about it you need to assess the atmosphere and get a real feel for the place. Only then will you know if it's right for you. The University offers plenty of opportunities to visit either on an Open Day Campus Tour or, if you have made an application, an Applicant Day. For more information please see our website **www.uclan.ac.uk/opendays**

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Telephone 01772 201201

All Course Enquiries
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Email cenquiries@uclan.ac.uk
www.uclan.ac.uk/ceps

+44 1772 892400 (Overseas)

Undergraduate programmes

BEng/MEng (Hons)
Computer-Aided Engineering

BEng (Hons) Computer Engineering

BEng (Hons) Digital Communications

BEng (Hons) Digital Signal
& Image Processing

BEng (Hons) Electronic Design Automation

BEng (Hons) Electronic Engineering

BEng (Hons) Electronic Engineering
(Foundation entry)

BEng/MEng (Hons)
Engineering Development

BEng (Hons) Engineering Development
(Foundation entry)

BEng/MEng (Hons)
Motor Sports Engineering

BEng (Hons) Robotics & Mechatronics

BSc (Hons) Astronomy (by distance learning)

BSc (Hons) Computing

BSc (Hons) Computer Games Development

BSc (Hons) Computer Network Technology

BSc (Hons) Forensic Computing

BSc (Hons) Information Systems Design

BSc (Hons) Mathematics

BSc (Hons) Motor Sports

BSc (Hons) Motor Sports (Foundation entry)

BSc (Hons) Multimedia Development

BSc (Hons) Software Engineering

MPhys/BSc (Hons) Astrophysics

MPhys/BSc (Hons) Mathematical Physics *

MPhys/BSc (Hons) Physics

FdSc Computing

FdSc Computing (Multimedia)

FdSc Computing (Networking)

FdEng Engineering (Nuclear)

FdEng Nuclear Decommissioning

FdEng Nuclear Related Technology

* subject to validation

Postgraduate programmes

MSc/PGDip Agile Software Projects

MSc/PGDip Computing

MSc/PGDip Database Systems

MSc/PGDip Digital Signal
and Image Processing

MSc/PGDip IT Security

MSc Maintenance Engineering

MSc/PGDip Network Computing

MSc Nuclear Safety, Security
and Safeguards

MSc Renewable Energy Engineering

MSc Wind Energy Engineering

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