MSc Robotics Engineering

Key Information

Award: MSc Robotics Engineering

Study Mode: Full-time

Duration: 12 months

Intake: October & February

Entry Criteria: A minimum of a Second-Class Honours degree in a relevant discipline awarded by a UK university, or an equivalent higher education qualification.. For students whose first language is not English there is a language requirement of IELTS 6.5 overall (reading 6.0, writing 6.0).

Fees and Funding: For tuition fee information, please go to the Student Finance pages at www.hope.ac.uk/postgraduate/ feesandfunding

School: School of Mathematics, Computer Science and Engineering.

Contact Details:

Student Recruitment, **enquiry@hope.ac.uk**

Disclaimer: Information is correct at time of print, however programme details can change.

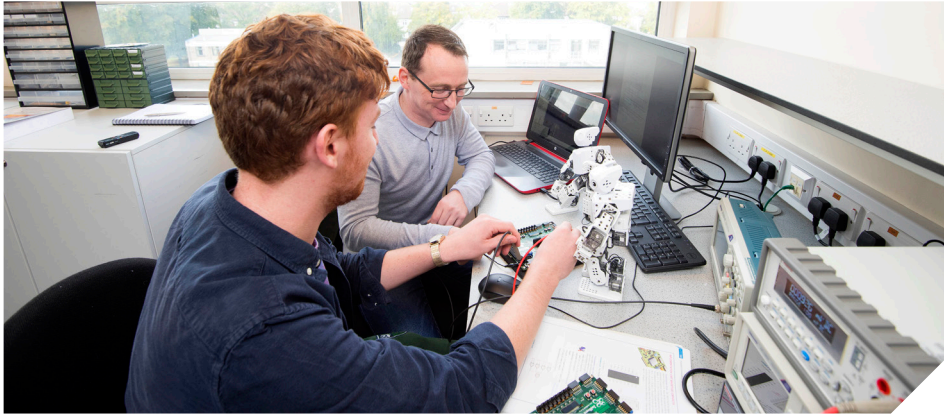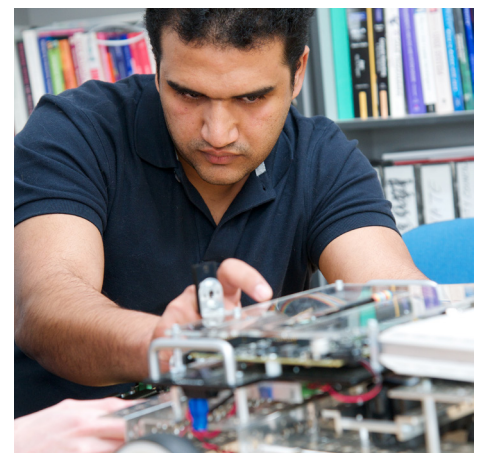## Programme Overview

Robotics is on the cusp of an exciting new era as robots become more reactive, intelligent and human-like, as well as finding applications in a range of industries including consumer and healthcare robotics.

We are in the midst of an increase in the pace of technological change and the changes in the coming decade will be a magnitude of order greater than anything that has gone before. A paradigm shift is about to take place that will forever change society; our ability to manufacture novel robots and new artificial intelligence techniques will both change the way we interact with technology and will allow technology to interact with us and our world in a far more nuanced way.

This MSc Robotics Engineering reflects recent software and hardware technological advances and exposes students to new, much sought-after skills and upto- date areas of research. Recent technological advances are incorporated into the course by developing novel cross disciplinary approaches and subject areas such as Embedded Systems, Artificial Intelligence and Virtual Reality.

Why choose Liverpool Hope?

- You will acquire key skills sought after by industry taught in well equipped, dedicated laboratories boasting the latest equipment.
- The School prides itself on excellent teaching quality recognised by a recent independent review, which specifically identified approachable staff providing close academic support.
- You will be part of a vibrant research community with the School hosting prestigious international events.
- We have an impressive graduate employment record, with recent successful appointments at organisations such as Airbus, Barclays and Oracle, as well as links with key organizations such as Microsoft.

LIVERPOOL HOPE UNIVERSITY

CONTACT

T: +44 (0)151 291 3111
E: enquiry@hope.ac.uk
www.hope.ac.uk

Curriculum

Robotics Engineering covers a wide range of specific topics such as:

- Data Analytics
- Theoretical Computer Science
- Numerical Methods
- Applied Computer Science
- Programming
- Data Communications
- Cyber Security
- Applied Computer Science, Data Analytics, Theoretical Computer Science and Numerical Methods
- High Performance Computing
- Advances in Computer Science
- Artificial Intelligence
- The Internet of Things.

The course will include an introduction to Robotics, covering topics such as actuators, sensors and mechatronics, with examples and categorization of robots (from mobile robots to robot arms and interactive robots); robotic applications including biomedical robotics (e.g. for minimally invasive surgery) and robotic rehabilitation, robotic hands (metamorphic hands, grasping and sensing) and industrial robotics; embedded systems and microcontrollers including the Internet of Things; the robot as a computational unit based on sensing, reasoning and action; artificial intelligence, navigation and machine learning. You will have the opportunity to develop the hardware and software for a robotic system.

Assessment is through a mixture of coursework and examination. The ethos within the School is to foster enthusiasm for Robotics and so assessment is largely through project work, giving you the opportunity to explore the subject area and focus on those specific topics that capture your interest. The project entails research and innovation as well as practical industrial applications of the ideas developed during the programme of study.

Teaching and Research Opportunities

Students work in modern, well-equipped laboratories, with access to computers running industry-standard and up-todate specialist software (e.g. Matlab, Visual Studio, 3D Studio Max) as well as more cutting edge technologies, from Robotics and 3D printing. Thanks to these facilities, students are able, for example, to develop their own mobile app, to control a robot developing embedded Artificial Intelligence and to prototype a new device with physical computing platforms like Arduino and Raspberry PI or to print 3D objects that have been designed with 3D software.

The School has a set of Computer Science Laboratories, a modern HPC (High Performance Computer), a Vision and Immersion Laboratory, an Electronic Laboratory and a Robotic Laboratory where students can experience full immersion tasks and experiment with exciting, current robots such as Aldebaran Nao, mobile-wheeled vehicles and drones.

Teaching and Research

The course is delivered by a small, enthusiastic team which prides itself not only on high teaching quality, which has been independently recognised, but also a vibrant research community; in the most recent Research Excellent Framework Exercise (REF 2021), 70% of the department's research was deemed to be internationally excellent or recognised. Staff have expertise in many areas such as Robotics and Mechatronics, Artificial Intelligence, Computational Mathematics, Virtual Reality, Data Science and Networking.

We have a purpose-built Robotics Laboratory in a new Science Building, equipped with the latest cutting edge technologies including industrystandard software (e.g. Matlab/Simulink, Labview, Visual Studio, 3D Studio Max), exotic robots and 3D printing facilities. The laboratory includes robots (Kilobot swarm robots, Aldebaran Nao, i-Sobot, FlowCode Robotic Buggies, Moway Robotic Buggies, Robo Builder, National Instruments robotic platform), embedded systems and devices for physical computing (e.g. Arduino, Makey Makey, Xilinx Zynq, XMOS, Anadigm FPAA), communication modules, wearable and biomedical sensors, marker less motion capture systems, UAVs and drones.

Future Career Opportunities

A course in Robotics Engineering will make you highly employable, having developed a range of specific skills in robotic systems, at a time when the robotics industry is rapidly developing, opening up new opportunities for people with these skills. The course will prepare you for a career in robotics engineering development or research in a wide range of industries.

LIVERPOOL HOPE UNIVERSITY