School of Mathematical and Computer Sciences

HUMAN ROBOT INTERACTION MSc (2 years)

Full-Time

Distinctly Ambitious

www.hw.ac.uk
Heriot-Watt University offers a first-rate environment for postgraduate study and research. We are one of the UK’s leading universities, recognized internationally for excellent teaching and technological innovation in our specialist areas of science, engineering, business management, languages and textile design.

Heriot-Watt became a university in 1966 and its origins go back to the foundation of the School of Arts in Edinburgh in 1821. We are Scotland’s most international university. A third of our students come from outside the UK.

We introduced the first Computer Science degree in Scotland in 1966, have taught MSc degrees in this subject from 1970 and are part of the world class SICSA research cluster that aims to sustain and expand Scotland’s research excellence in Informatics and Computer Science.

This MSc in Human Robot Interaction is a 2 year postgraduate degree. The first year imparts the knowledge and skills needed to study HRI at Masters level in the second year.

It teaches the understanding and skills to engineer robots that can assist human beings while having their behaviour controlled and shaped by human interaction. Students learn the principles of interactive robotics while developing skills in designing, building and evaluating them.

Graduates from any discipline start with an introduction to AI, study the art of software engineering and learn relevant topics in computing. Those, who need to, may also enhance their technical English and research skills.

Admission in September requires a good honours degree, numeracy and some prior ability at programming. The English level required is IELTS 6.0.

### Year 1

Introduces AI and teaches software engineering, interactive design and topics in Computer Science:

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<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td>F29AI AI and Intelligent Agents</td>
<td>F20AD Advanced Interaction Design</td>
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<tr>
<td>F21SF Software Engineering Foundations</td>
<td>F21AS Advanced Software Engineering</td>
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<td>2 options:</td>
<td>2 options:</td>
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<tr>
<td>F29DC Data Communications &amp; Networking</td>
<td>F29OC Operating Systems &amp; Concurrency</td>
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<tr>
<td>F21DF Databases &amp; Information Systems</td>
<td>C69RO Research Preparation in English II</td>
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<tr>
<td>F29KM Knowledge Management</td>
<td>B59RM Robotic Mechanical Systems</td>
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<tr>
<td>C69RP Research Preparation in English I</td>
<td>F21SM Software Engineering Master Class</td>
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### Year 2

Teaches Human Robot Interaction at Masters level:

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<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
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<tr>
<td>F21HR Human Robot Interaction</td>
<td>F21CA Conversational Agents &amp; Spoken Language Processing</td>
<td>F21MP Masters Project</td>
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<tr>
<td>F21RO Intelligent Robotics</td>
<td>F21RP Research Methods &amp; Project Planning</td>
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<td>2 options:</td>
<td>2 options:</td>
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<tr>
<td>F21GA 3D Graphics &amp; Animation</td>
<td>F21BD Big Data Management</td>
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<tr>
<td>F21DL Data Mining &amp; Machine Learning</td>
<td>F21GP Computer Games Programming</td>
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<tr>
<td>B31SC Digital Signal Processing</td>
<td>B31SE Image Processing</td>
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<tr>
<td>F21SA Statistical Modelling &amp; Analysis</td>
<td>C11PA Project Management</td>
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YEAR 1 COURSES

F20AD Advanced Interaction Design covers the principles, organisation and good practice in requirements capture, design and evaluation in interacting with computer based systems. It also introduces some research.

F21AS Advanced Software Engineering covers advanced Java programming, the design of algorithms for key types of data and thread management, as well as advanced techniques in software project management.

F29AI AI and Intelligent Agents covers fundamental concepts and techniques in AI including planning, search and knowledge representation as well as the use of some AI techniques in AI including planning, control and robot kinematics and provides training in mobile robot mechanical design.

F29OC Operating Systems and Concurrency introduces operating systems, their basic principles and shell programming as well as the theory and practice of concurrent hardware and software systems.

C69RP Research Preparation in English I covers Computer Science literature search and its summarisation, research planning and assessing research impact. It also enhances technical English skills in Computer Science.

B59RM Robotic Mechanical Systems introduces computer integrated manufacturing, computer numerical control and robot kinematics and provides training in mobile robot mechanical design.

F21GA 3D Graphics and Animation introduces 3D computer graphics concepts, algorithms and processing and applies them to physical and behavioural animation.

F21SA Statistical Modelling and Analysis covers research planning, literature search and its summarisation, research planning and assessing research impact. It also enhances technical English skills in Computer Science.

YEAR 2 COURSES

F21BD Big Data Management covers the principles and practice of object-oriented programming in Java as well as introducing the art of software engineering.

F21GP Computer Games Programming covers computer game concepts, design, modelling techniques, principles and implementation techniques. It includes 2D and 3D tools and AI and graphics programming.

F21SM Software Engineering Master Class is an academically supervised exercise in researching, developing and presenting two master classes in a technical topic in Computer Science.

F21DL Data Mining and Machine Learning covers DM and ML concepts and techniques, teaches critical awareness of their relative merits and introduces common application types.

F21SA Statistical Modelling and Analysis covers statistical modelling and analysis techniques for data review and presentation and demonstrates their practical application.

B31SC Digital Signal Processing teaches the theory and practice of signal processing and imparts specialised DSP skills and knowledge of techniques using various DSP development tools.

F21HR Human Robot Interaction imparts the understanding and skills needed to build intelligent robots for HRI through a supervised group project in making a talking robot.

F21SI Human-Computer Interaction introduces the theory and concepts of human-computer interaction, cognitive robotics and user experience.

F21EF Research Methods and Project Planning prepares student for their MSc project. It covers research planning, literature review and critique, requirements analysis, evaluation design and professional and normative issues raised.

C11PA Project Management teaches the knowledge and skills of a professional project manager including quantitative and qualitative techniques and tools, strategy formulation and project scheduling.

F21MP MSc Project is a 15 week full-time exercise in applying knowledge acquired in the MSc. It is academically supervised and assessed by a 15000 word dissertation. Students prepare for it in F21RP.
Entry Requirements

Applicants require a good honours degree or its equivalent, numeracy and some knowledge of programming. They must also have a minimum English level of IELTS 6.0.

Suitable applicants include UK honours graduates or EU or overseas graduates from 4 year programmes in any degree area that wish to retrain as AI professionals.

Applicants requiring sponsorship for a tier 4 visa to study in the UK via a CAS letter must demonstrate they satisfy the UK Borders Agency’s minimum English language requirements i.e. IELTS 5.5 in reading, writing, speaking and listening.

How to apply

Apply online at www.hw.ac.uk/study/apply/uk/postgraduate.htm

Supporting documents including 2 academic references, degree certificates, transcripts of marks and English test results can be uploaded digitally to the online application facility.

Contact information

Postgraduate Admissions
Room 1.24
Earl Mountbatten Building
School of Mathematical & Computer Sciences
Heriot-Watt University, Riccarton
Edinburgh EH14 4AS, SCOTLAND

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+44 (0) 131 451 3327
MACSpgenquiries@hw.ac.uk
www.macs.hw.ac.uk/cs/pgcourses

Post-Study Work Opportunities in Scotland

Good opportunities exist for students who graduate in a specialism in demand in the Scottish economy to get employment here. The Scottish government is keen to help talented individuals from around the world come to study, work and live here. More information can be found at www.talentscotland.com

Career Prospects

Graduates from one of our MSc programmes can expect to be able to gain employment with robotics companies, software houses, IT organisations, research and development divisions of businesses, financial services operations, defence contractors or government IT agencies and as researchers or research students within universities.

Fees

The fee for this 2 year MSc programme at Heriot-Watt University in Edinburgh starting in September 2018 is £5360 in both years for UK and EU students. Overseas students pay £12800 in the first year and £18120 in the second. The cost of living during one year of study in Edinburgh is estimated at £10500.

English Study

Non-native English speakers with less than IELTS 6.0 may take 6, 10 or 14 weeks of English study with our English Language Department before starting.

Employment

First destinations of some of our recent MSc graduates:
Software Engineer, Ion Concept Systems
Software Engineer, Logica
PhD Computer Science, Heriot-Watt University
IT Manager, NCS
Database Administrator, Pension Fund Commission
System Specialist, UBS AG (Bank)
Test Engineer, IBM
Systems Engineer, GEC Marconi Avionics
Graduate Software Engineering, Thomson Marconi Sonar Ltd
Computer Programmer, Bull Europe
Software Consultant, Absoft
Software Engineer, Thales (UK)

Scholarships and Awards

Students can apply for a variety of scholarships from the Scottish executive, other bodies and our school. Please visit www.hw.ac.uk/study/scholarships/postgraduate-taught.htm

For more information, please visit www.hw.ac.uk/study/apply/uk/postgraduate.htm