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 innovative technology 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. Over 30% 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.

The MSc in Computing is a 2 year postgraduate degree. The first year imparts the knowledge and skills needed to study the subject at Masters level in the second.

Graduates from any discipline start by learning the art of software engineering, study some key computing topics and develop relevant research and technical English skills that prepare them for advanced study of Computer Science in the following year.

Admission in September requires a good degree of 3 years duration, numeracy and some prior ability at programming. The English level required is IELTS 5.5.

At the end of year 1 students may progress to year 2 or graduate instead with a Graduate Diploma in Computer Science and switch to a 1 year MSc we offer such as

- Artificial Intelligence
- Data Science
- Human Robot Interaction
- Network Security

if they have taken suitable options in year 1.

**Year 1** teaches software engineering, research and technical language skills, and some topics in Computer Science:

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C69RP Research Preparation in English I</td>
<td>C69RQ Research Preparation in English II</td>
</tr>
<tr>
<td>F21SF Software Engineering Foundations</td>
<td>F21AS Advanced Software Engineering</td>
</tr>
<tr>
<td>2 options:</td>
<td>2 options:</td>
</tr>
<tr>
<td>F29AI AI and Intelligent Agents</td>
<td>F20AD Advanced Interaction Design</td>
</tr>
<tr>
<td>F29DC Data Communications &amp; Networking</td>
<td>F20NA Network Applications</td>
</tr>
<tr>
<td>F21DF Databases &amp; Information Systems</td>
<td>F29OC Operating Systems &amp; Concurrency</td>
</tr>
<tr>
<td>F21IM Information Technology Master Class</td>
<td></td>
</tr>
</tbody>
</table>

**Year 2** teaches Computer Science at Masters level with a focus on software engineering, security and systems issues:

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>F21CN Computer Network Security</td>
<td>C11PA Project Management</td>
<td>F21MP Masters Project</td>
</tr>
<tr>
<td>F21SC Industrial Programming</td>
<td>F21RP Research Methods &amp; Project Planning</td>
<td></td>
</tr>
<tr>
<td>2 options:</td>
<td>2 options:</td>
<td></td>
</tr>
<tr>
<td>F21GA 3D Graphics &amp; Animation</td>
<td>F21AD Advanced Interaction Design</td>
<td></td>
</tr>
<tr>
<td>F21BC Biologically Inspired Computation</td>
<td>F21AN Advanced Network Security</td>
<td></td>
</tr>
<tr>
<td>F21RO Intelligent Robotics</td>
<td>F21BD Big Data Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F21GP Computer Games Programming</td>
<td></td>
</tr>
</tbody>
</table>
YEAR 1 COURSES

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

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

F29AI AI & Intelligent Agents covers fundamental concepts and techniques in AI including planning, search and knowledge representation as well as the use of some AI programming languages.

F29DC Data Communications & Networking introduces the principles of computer and data communications with a focus on the Internet’s TCP/IP protocols.

F21DF Database & Information Systems covers the principles of modern database systems, information systems methodologies and interactive and programmed use of SQL and NoSQL databases.

F21IM Information Technology Master Class is an academically supervised exercise in researching, developing and presenting two master classes in a technical topic in Information Technology.

F20NA Network Applications covers the principles and craft of Internet application development with an emphasis on a range of state-of-the-art web technologies. It also covers email and textual conferencing.

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 continues the themes of C69RP and also covers critically appraising Computer Science research, evaluating such research and presenting it with posters.

F21SF Software Engineering Foundations covers the principles and practice of object-oriented programming in Java as well as introducing the art of software engineering.

YEAR 2 COURSES

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

F21AD Advanced Interaction Design covers the principles, research and good practice involved in requirements capture, design and evaluation in interacting with computer based systems. It also introduces some research topics.

F21AN Advanced Network Security develops critical analysis skill in computer network security and covers threat analysis, penetration testing, vulnerability exploitation and countermeasure deployment.

F21BD Big Data Management covers the storage and handling of complex and large data sets, the semantic web and data integration issues with relational and NoSQL databases.

F21BC Biologically Inspired Computation covers limitations of traditional approaches to computation that are addressed within and among biological organisms by means such as evolutionary algorithms, swarm intelligence, neural networks and cellular automata.

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

F21CN Computer Network Security covers computer security concepts, principles and technology. It addresses both symmetric and public key cryptography and the use of a variety of network security assurance methods and tools.

F21SC Industrial Programming develops advanced skills in two programming languages in widespread practical use in industry. One is C# and the other is Python. It also covers relevant tools and development environments.

F21RO Intelligent Robotics covers the fundamentals of manipulating, the basics of mobile robots, sensing techniques, behaviourbased robotics and cognitive robotics.

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

C11PA Project Management covers professional practice, project planning, strategy formulation, project control, scheduling and leadership. It also addresses Agile project management.

F21RP Research Methods & 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.

We may alter the courses offered at any time. Some courses may not run every year. Not every course combination may be possible to take. Students must satisfy each course’s prerequisites and their course choice must be agreed with the programme’s director.
Entry Requirements

Applicants require a good degree (3 or 4 years) or its equivalent, numeracy and some knowledge of programming. They must also have a minimum English level of IELTS 5.5 in all 4 parts.

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

Applicants may also have 3 year ordinary degrees on the EU’s Bologna model or have done 3 year diplomas in China or India and wish to strengthen their relevant academic knowledge by one further year of undergraduate study while enhancing their English before Masters level study in their second year.

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

+44 (0) 131 451 8444
+44 (0) 131 451 3327
MACSpgenquiries@hw.ac.uk
www.macs.hw.ac.uk/cs/pgcourses