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.

**Aim of Programme**

The aim of this MSc programme is to impart the theory and skills for managing and analysing very large and complex data sets, sometimes referred to as Big Data. Students will learn how to model, store and process these data sets using the latest algorithms and techniques. They will also learn apt methods and tools for visually exploring data.

The programme is research led and students will benefit from the interaction with staff who are involved in internationally leading research projects in the field. The skills acquired by students will be applicable to industrial applications as well as scientific data exploration such as business intelligence or e-health.

**Duration of Programme**

The full-time MSc programme starts in mid September and lasts 1 year. The Postgraduate Diploma starts at the same time but only lasts 8 months. Students completing the PG Diploma at MSc level may transfer to the MSc.

Part-time study for the MSc over 2 years is also possible by special arrangement with the programme director.

**Programme Structure**

The first two semesters (September-May) are spent studying taught courses in Data Science. At the same time research skills are developed as a preliminary for work on an MSc project. Exams take place at the end of each semester.

In the third semester (May-August) students undertake a specialist project and write it up as a dissertation. It enables development and consolidation of skills introduced in the taught courses, applying them to a challenging practical problem in the subject area.

The project is carried out under the supervision of an academic who is an expert in the field. In some cases the project can be carried out in collaboration with an outside industrial or academic organisation.

The table shows the essential and optional courses in the first 2 semesters. Full time students must study 4 courses each semester.

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<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
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<tbody>
<tr>
<td><strong>F21DL</strong>  Data Mining and Machine Learning</td>
<td><strong>F21BD</strong>  Big Data Management</td>
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<tr>
<td><strong>F21SA</strong>  Statistical Modelling and Analysis</td>
<td><strong>F21RP</strong>  Research Methods and Project Planning</td>
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<td><strong>Options:</strong></td>
<td><strong>Options:</strong></td>
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<tr>
<td><strong>F21BC</strong>  Biologically Inspired Computation</td>
<td><strong>F21AS</strong>  Advanced Software Engineering</td>
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<tr>
<td><strong>F21CN</strong>  Computer Network Security</td>
<td><strong>F21DE</strong>  Digital and Knowledge Economy</td>
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<tr>
<td><strong>F21DV</strong>  Data Visualization and Analytics</td>
<td><strong>F21DP</strong>  Distributed and Parallel Technologies</td>
</tr>
<tr>
<td><strong>F21SC</strong>  Industrial Programming</td>
<td><strong>F21NA</strong>  Network Applications</td>
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<tr>
<td><strong>F21SF</strong>  Software Engineering Foundations</td>
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To impart an appreciation of why traditional computation finds it difficult or impossible to perform certain key tasks in pattern recognition, problem solving and autonomous intelligence.

To show how a range of natural biological systems handle these tasks.

To introduce the main biologically-inspired algorithms and techniques which are now commonly researched and applied.

To establish a practical understanding of the real-world problems to which these techniques may be applied.

To impart understanding of the dynamic data and dirty data.

To give practical experience of a large scale heterogeneous data, linked data, distributed and parallel software applications including distribution and parallel software development.

To develop proficiency in modern industrial programming languages such as C#, C++11, Python, PHP.

To enable the elaboration and combination of system components in different languages.

To enable an agile and flexible response to changes in industrial practices and let industrial practitioners participate to provide context and applicability.

To impart understanding of the object oriented paradigm and the process of object oriented design.

To support the development of object oriented programs in Java.

To carry out object oriented design from specification, document the design using appropriate techniques, implement the design in Java and evaluate the results.

To develop an understanding of windows -based systems and their development.

To impart understanding of the principles of data visualization and data analysis for big data, complex data, heterogeneous data, linked data, dynamic data and dirty data.

To impart the ability to implement interactive web-based visualisation systems and assess their effectiveness.

To consolidate proficiency in imperative programming and software development.

To develop further object oriented programming and design methods.

To introduce concurrent programming techniques and the deployment of patterns and UML in software engineering.

To instil understanding of the concepts and benefits of advanced software engineering methods.

To give practical experience of a large software engineering project.

To review principal abstractions, methods and techniques for the management of large and complex data sets (“Big Data”).

To develop an understanding of the tools and foundations of the Semantic Web.

To impart ability to appreciate critically a range of data integration solutions.

To impart extensive, detailed and critical knowledge of the design, implementation and evaluation techniques for conversational agents and spoken language processing.

To develop an awareness of current research and emerging issues in the field of conversational agents and spoken language processing.

To introduce a range of interdisciplinary research methods and specialised practical skills involved in building working conversational interfaces.

To consider the impact of deploying new technologies and emerging knowledge in developed economies.

To discuss e-Business, as a modern business model that leverages technical advancements to create economic growth.

To introduce relevant models, analytical techniques, technologies and methodologies including business, organisational, knowledge and technology based issues.

To facilitate the dialogue between business and computing personnel, and translate business requirements to computing ones and vice versa.

To explore technologies and techniques underlying advanced distributed and parallel software development including distribution technologies, parallel program design and performance analysis.

To enable students to develop skills in critical thinking, research planning, academic writing and experimental design appropriate for a post-graduate programme.

To enable students to gain skills in project planning and an awareness of legal, social, ethical and professional issues relevant for IT professionals.

To enhance students' employability by development of job seeking and career planning skills.
Entry Requirements

Applicants require a good honours degree with a major academic component of Computing or IT that includes study of databases and programming or its equivalent. Graduates with a little less than this may sometimes be admitted to the Postgraduate Diploma programme. If their exam and coursework performance is MSc level by May, they may then be recommended for transfer to the MSc.

Honours graduates without relevant computing knowledge, who wish to retrain and become Data Scientists, may like to consider doing our 2 year MSc in Data Science instead.

Non-native English speakers must also satisfy the university’s requirements for competency in English. This can be done with an IELTS score of 6.5 and in other ways. English language training can also be undertaken at Heriot-Watt University before starting the MSc.

Applicants requiring sponsorship for a tier 4 visa to study in the UK via a CAS letter must also satisfy the UK Borders Agency’s minimum English language requirements. They are 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

Post-Study Work Opportunities

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

MSc graduates can expect to get employment with software houses, IT companies, R+D divisions of companies, financial services organisations, defence contractors or government IT agencies and as researchers or research students within universities.

Professional Accreditation

This MSc programme is accredited by the Chartered Institute of IT or BCS and should fulfil its further education requirements for a Chartered IT Professional. It also partially fulfils membership requirements for the CEng and CSci professional bodies.

Scholarships and Awards

International students can apply for a scholarships from the Scottish executive, other bodies and our school.

www.macs.hw.ac.uk/cs/pgcourses/finance.htm#international
Scots and EU citizens can get SAAS loans to cover most of the fees.

www.saas.gov.uk

Other scholarships may be available:

www.hw.ac.uk/study/scholarships/postgraduate-taught.htm

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)

Cost

The Scots/UK/EU fee for this one year full time MSc programme at Heriot-Watt university in Edinburgh starting in September 2019 is £7168. The overseas fee is £18680. The cost of living during one year of study in Edinburgh is estimated at £10800. The Dubai campus fee is AED 81900 for 2019/20.