INDUSTRY LINKS
We have good links with industry and MSc students may opt to do an industrially sponsored MSc project.

PROFESSIONAL RECOGNITION
This MSc programme is accredited by the British Computer Society and should fulfil its further education requirements for a Chartered IT Professional. It should also partially fulfil membership requirements for the CEng and CSci professional bodies.

ASSESSMENT METHODS
Students are assessed on component courses by a mixture of exams and coursework. The MSc project is assessed by a MSc dissertation and a poster presentation.

ENTRY REQUIREMENTS
Applicants require a first or second class honours degree in computer science or its overseas equivalent. Candidates holding a little less than this may be admitted to the Postgraduate Diploma programme. If their performance is satisfactory at MSc level, they may then be recommended for transfer to the MSc.

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- 2 semesters English (for IELTS 4.5-5.0)
- 12 weeks English (for IELTS 5.5)

Further details can be found at www.english.hw.ac.uk

FEES, FUNDING AND SCHOLARSHIPS
Latest tuition fees are published on our fees web pages: www.hw.ac.uk/fees

We offer scholarships to well qualified applicants. Instructions on applying can be accessed from our scholarship web pages: www.scholarships.hw.ac.uk

HOW TO APPLY
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CONTACT
POSTGRADUATE ADMISSIONS
ROOM 1.24
EARL MOUNTBATTEN BUILDING
SCHOOL OF MATHEMATICAL & COMPUTER SCIENCES
HERIOT-WATT UNIVERSITY, RICARTON,
EDINBURGH EH14 4AS, SCOTLAND
+44 (0) 131 451 4152
+44 (0) 131 451 3327
msc.request@macs.hw.ac.uk
www.macs.hw.ac.uk

GOOD REASONS
1. Research Quality
   We are part of world class SICSA research cluster
2. Teaching Quality
   We score well for student satisfaction
3. Employability
   We are in top 10% of UK universities for employment
4. Professionalism
   British Computer Society accredits our specialist MSc degrees
5. Prime Location
   We have a green campus on the edge of the historic city of Edinburgh

SOFTWARE ENGINEERING
MSc / PG DIPLOMA

School of Mathematical and Computer Sciences
Your University
an overview

Heriot-Watt University offers a superb environment for postgraduate study. We are one of the UK’s leading universities, recognised internationally for excellent teaching and research in our specialist areas of science, engineering, business management, languages and textile design.

Our community of postgraduate students is made up of brilliant, highly imaginative and self-motivated individuals, who work closely with our forward-looking and energetic research-active academic staff. This collaborative atmosphere is fundamental to Heriot-Watt’s enviable academic and research reputation.

Those of you who choose to study with us will discover high quality taught and research programmes, flexible student-centred delivery, unrivalled facilities and pioneering research.

www.macs.hw.ac.uk

PROGRAMME BACKGROUND
The full-time MSc programme starts in mid September and lasts 1 year. The 8 taught courses can also be studied over 9 months as part of a Postgraduate Diploma programme with the same title. Students who perform at MSc level on the Postgraduate Diploma programme may transfer when it ends to the MSc programme and complete their project for an MSc degree.

Part-time study for the MSc over two years is also possible by special arrangement with the programme director. A typical arrangement would be for students to take 2 courses in semesters 1 and 2 in the first year, 2 courses in semesters 1 and 2 in the second year and split the research and implementation of the MSc project over 2 years.

PROGRAMME OBJECTIVES
The aim of this MSc programme is to impart the understanding and skills to engineer software at an advanced level to professional standards. Students can specialise in particular areas such as the development of dependable systems or mobile applications or advanced interactive systems like games or novel applications using biologically inspired models of computing.

The MSc project is carried out under the supervision of an individual 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.

PROGRAMME STRUCTURE
The first two semesters (September-May) are spent studying taught courses in software engineering. 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.

Full time students take 4 courses in semester 1 and 4 courses in semester 2 and must normally take courses in bold.

Semester 1
• Computer Network Security
• Information Systems Methodologies
• Mobile Communications & Programming
• Rigorous Methods for Software Engineering
• Software Engineering Foundations
• Systems Programming & Scripting

Semester 2
• Advanced Interaction Design
• Advanced Software Engineering
• Biologically Inspired Computation
• Computer Games Programming
• Research Methods & Project Planning
• Software Simulation & Modelling

Advanced Interaction Design – advanced interface requirements, design and evaluation issues for interactive software for various contemporary application uses

Advanced Software Engineering – advanced OOP design in Java, data structures, threads, patterns, software engineering methodologies and project planning

Biologically Inspired Computation – evolutionary and genetic algorithms, swarm intelligence, neural computation and ANN, artificial life, membrane computing

Computer Games Programming – game design, game tools, 2D and 3D, game state, game engines, physics engines, path planning, learning and adaptation, game theory

Computer Network Security – security fundamentals, cryptography and its uses, formal techniques, PKI, OS and network security, security tools, secure applications

Information Systems Methodologies – systems principles and classification, IT life cycle, NIMSAD and Fitzgerald IS methodologies, process improvement models

Mobile Communications & Programming – IP routing in fixed, mobile and ad hoc networks, wireless security issues, programming frameworks for handheld devices

Research Methods & Project Planning – critical thinking, doing research, academic writing, experimental design, project planning, career planning, normative issues

Rigorous Methods for Software Engineering – behavioural interface specification, verification frameworks, reasoning about programs, software processes and metrics

Software Simulation & Modelling – modelling, logics, OWL, ontology reasoning, algorithms, stochastic models, Petri nets, Markov chains, various examples

In the third semester (May-August) students undertake a specialist MSc project which is written up as a 10,000 word dissertation. This project enables further development and consolidation of skills introduced in the taught courses, applying them to a challenging practical problem in this subject area.

GRADUATE OPPORTUNITIES
Graduates from the programme can expect to be able to get employment with software houses, IT companies, research and development divisions of companies, financial services organisations, defence contractors or government IT agencies and as researchers or research students within universities.

www.postgraduate.hw.ac.uk/apply/
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Software Engineering
MSc / PG Diploma