MANCHESTER 1824

The University of Manchester

COMPUTER SCIENCE

POSTGRADUATE COURSES

SHAPE YOUR FUTURE

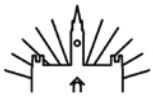
Learn today, lead tomorrow

CONTENTS

SHAPE YOUR FUTURE: CAREERS

Shared first-place for the best UK research environment in Computer Science.
(REF 2021)

28th best university in the world, 9th in Europe and 6th in the UK.
QS World Rankings 2023



Birthplace to the first stored program computer and world's first graduates of Computer Science

Ranked top ten globally for action towards the UN Sustainable Development Goals.
THE University Impact Rankings 2022

Read more about our rankings and reputation including REF results.

CAREER CATEGORIES

Master's courses at The University of Manchester are designed to build the specialist knowledge and skills you need to enhance your employability and tackle the challenges facing our world today.

Our degrees are delivered with sustainability in mind, to give you the best grounding for the careers of the future. There are common themes and ideas that underpin our master's, which we have illustrated throughout this brochure. Look out for the following across our courses:

A ENERGY CAREERS: our master's courses equip you with first-class analytical skills that prepare you for careers in a world that is working through the energy transition.
B BUILDING SUSTAINABLE FUTURES CAREERS: securing existing infrastructures and planning for future sustainable developments are key aspects of our postgraduate courses.
C LEADING CHANGE CAREERS: a changing world requires new leadership, and our master's courses develop you as decision-makers and forward-thinkers.
D INNOVATING TECHNOLOGY CAREERS: as global priorities evolve, so do technological solutions. Our master's degrees train you in the most current technology and encourage innovations for our future.
E RESEARCH FOR NEW HORIZONS: our master's courses can lead you to further study with postgraduate research programmes (PhDs) where you will investigate solutions and methods for future science and engineering practitioners.

CAREERS SERVICE

As a postgraduate student you may already have a career path in mind, but we'll do all we can to help you get there. We'll give you the opportunities to develop your skills and networks, and support tailored to your needs.

Our first-class Careers Service offers support and advice throughout your time at The University of Manchester, to help you make the most of your time here and best prepare you for your future. From CV and application advice to employer workshops and our job platform Career Connect, the Careers Service for students and graduates can help to put you in the best position to secure employment and act as a launchpad for your long-term career aspirations.

SUSTAINABILITY

LEADING THE WORLD ON SUSTAINABLE DEVELOPMENT

The quality and scale of our research, when compared against the UN's Sustainable Development Goals (SDGs), has been ranked in the top ten globally by the Times Higher Education University Impact Rankings in 2022.

The 17 SDGs are the world's call to action on the most pressing challenges and opportunities facing humanity and the natural world, and we are playing a leading role in tackling them.

As one of the world's leading research institutions, as well as being the only university in the UK to have social responsibility as a core goal, The University of Manchester is proactively tackling the SDGs in four ways – through our research, learning and students, public engagement activities and responsible campus operations.

Our 2021/22 SDG report outlines how we are tackling the SDGs.

OUR MASTER'S COURSES CONNECT WITH THE FOLLOWING UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

- Goal 4: Quality education
- Goal 8: Decent work and economic growth
- Goal 9: Industry, innovation and infrastructure
- Goal 17: Partnerships for the goals

FACILITIES AND RESOURCES

COMPUTER SCIENCE

The Kilburn Building is our base, not only home to modern lecture theatres but dedicated common rooms for undergraduates, postgraduates, and staff, as well as laboratories for collaborative study.

In addition to this, the department benefits from leading computing facilities, featuring:

- over 300 computers exclusively for the use of our students;
- collaborative working spaces and equipment specifically designed for group work;
- access to a range of integrated development environments;
- specialist electronic system design and computer engineering tools.

Explore our facilities, including the Cognitive Robotics Laboratory, e-Science Laboratory, Mesoscience and Nanotechnology Workshop and the Interaction Analysis and Modelling Laboratory.

MSC ADVANCED COMPUTER SCIENCE

Read more about this course

The opportunities this course opens are vast. Designed not only to further your topics of interest, you will finely-tune your route across a broad spectrum of specialised areas. Spanning core modules and interdisciplinary research strengths, here at Manchester you build upon a long legacy of computing innovation.

With a keen focus on pairing knowledge with applied skill, you will find lectures and seminars well supported by practical exercises. Alongside your exciting and challenging modules of choice, you will get the opportunity to put your skill-set to use with an MSc project - one of the most rewarding components of the course.

Over the duration of your study, you will select three themes from a choice of seven, each combining course units that relate and enhance one-another. Certain combinations are integrated into specialised pathways, including, artificial intelligence, computer security, data and knowledge management, and digital biology.

Computational thinking informs our understanding of phenomena across a broad range of areas, from engineering and physical sciences to business and society. On this MSc, you will amplify your skills learning from world-leading academics, ahead of a rewarding career in this ever-expanding field.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

D INNOVATING TECHNOLOGY CAREERS **E RESEARCH FOR NEW HORIZONS**

WHERE DO OUR GRADUATES WORK?

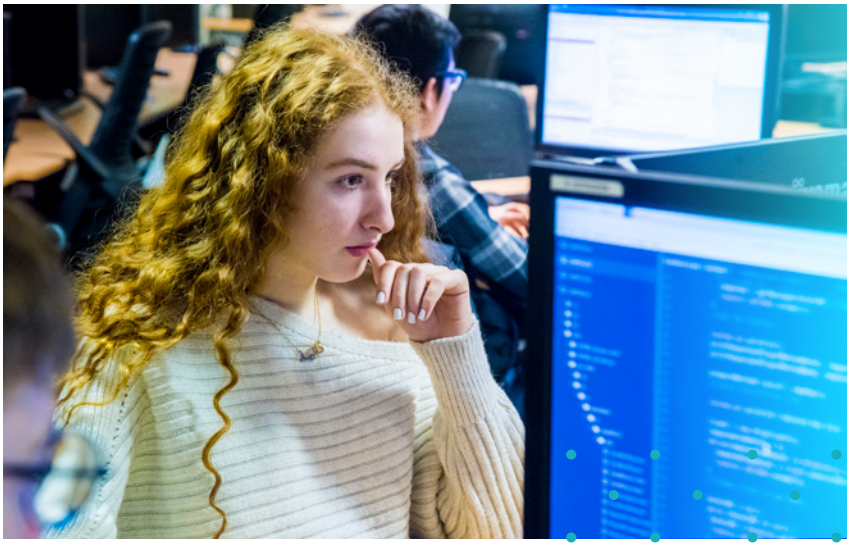
- ARM
- BBC
- EA Games
- Google
- IBM
- NHS
- Academic research

"MSc in Advanced Computer Science helped me to go beyond the of basics of Computer Science concepts, with cutting edge industry-focused modules - like web ontology programming and data engineering. My dissertation on internet data modelling, supported by a fantastic supervisor, provided an excellent foundation in understanding web programming, and played a vital role in securing my first Software Job.."

Abhishek Manjunath Prasad
MSc Advanced Computer Science graduate
Now working as a Senior Software Engineer for Infovision Labs

COURSES IN RELATED SUBJECT AREAS:

MSc Digital Biology
MSc Artificial Intelligence
MSc Data Science (Business and Management)



WHAT DO OUR GRADUATES DO?

- Software Engineer
- Project Manager
- Senior Software Engineer
- Software Developer
- IT Consultant
- Director
- Research Associate
- Managing Director
- Computer Programmer

ENTRY REQUIREMENTS AND PREREQUISITES:

We require a First from a UK university, or the overseas equivalent, in a Computer Science degree with a minimum of 50% Computer Science content.

Applicants with extensive Computer Science industrial experience and a 2:1 honours degree in Computer Science, or its overseas equivalent, may also be considered for admission. We also require that all applicants have a strong background in Computer Science reflected, for example, in solid programming and software development skills.

IELTS: overall score of 7.0 with no sub-test below 6.5

MSC ACS: DIGITAL BIOLOGY

Read more about this course

Specially designed for computer scientists looking for specific medicine or biology experience, this pathway provides the core skills needed for a career working with healthcare providers, the pharmaceutical industry, and bio-health research institutes.

This core theme is complemented by a range of areas too, each fostering a depth and breadth of applications sought-after within the digital biology field.

An incredibly exciting time for both biology and medicine, the genomics revolution is opening whole new areas of research. This spans from new insights on how organisms function, to our growing understanding of disease and disease processes. And now, medicine is currently involved in the largest and most ambitious IT project in the world - the capture and interpretation of electronic patient records. Not only will this make healthcare systems far more effective, but will help spot new diseases early, while they can still be contained and controlled.

At the heart of all these developments lies both data and knowledge. There is a real need and demand for the skills and techniques that computer scientists can bring these problem areas. Biology and healthcare now provide some of the fastest growing and most challenging areas for computer scientists to apply their skills.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

B BUILDING SUSTAINABLE FUTURES CAREERS
D INNOVATING TECHNOLOGY CAREERS **E RESEARCH FOR NEW HORIZONS**

WHERE DO OUR GRADUATES WORK?

Students use this degree as a starting point for careers in health informatics/bioinformatics either in research or in healthcare. A lot of students have used this course to move to Ph.D.s in health informatics or bioinformatics, and then on to lectureships/RAs

"Since graduating from my Master's in Advanced Computer Science, I first worked as a faculty member at Taibah University in Saudi Arabia. During my MSc, I developed a keen interest in the area of health informatics, the main focus of mine within Digital Biology theme. After such a positive experience, I returned to Manchester for my PhD, in health informatics - focusing on the potential role of blockchain and smart contracts to support sharing of genomic data in the clinical context."

Faisal Albalwy
MSc Advanced Computer Science graduate
Now doing PhD in health informatics at The University of Manchester

COURSES IN RELATED SUBJECT AREAS:

MSc Health Data Science
MSc Data Science (Computer Science Informatics)
MSc Computer Science and Biomedical Science

WHAT INDUSTRIES DO OUR GRADUATES WORK IN?

- Medicine
- Healthcare
- Genomics Research
- Pharmaceuticals
- Data Security
- Academic Research

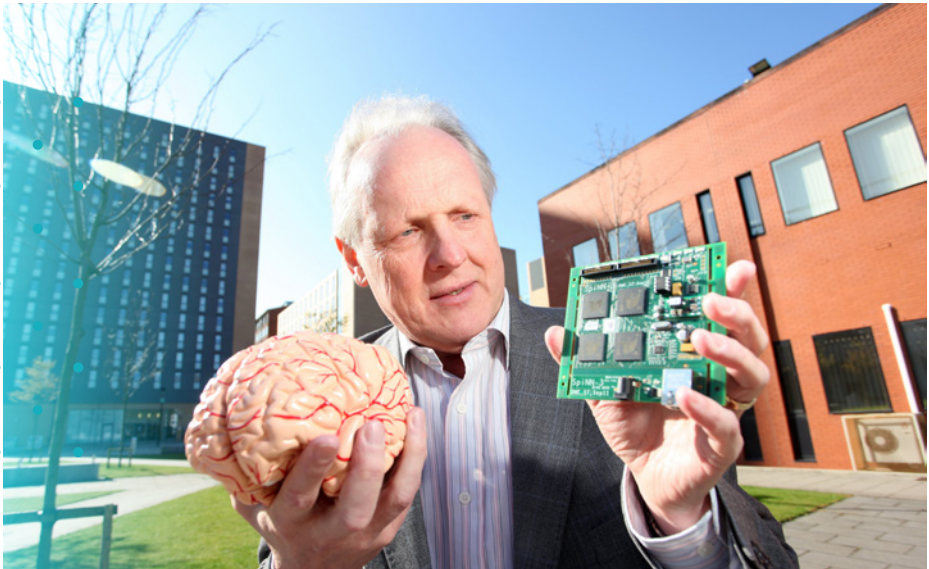
WHAT DO OUR GRADUATES DO?

- Research Computer Scientist
- Healthcare Data Researcher
- Data Engineer
- Cyber Security Analyst
- Data Analyst

ENTRY REQUIREMENTS AND PREREQUISITES:

We require a First or equivalent in Computer Science or in a joint degree with at least 50% Computer Science content. Applicants with extensive Computer Science industrial experience and a good honours degree in Computer Science, or its overseas equivalent, may also be considered for admission. We also require that all applicants have a strong background in Computer Science reflected, for example, in solid programming and software development skills.

IELTS: overall score of 7.0 with no sub-test below 6.5



MSC ACS: ARTIFICIAL INTELLIGENCE

Read more about this course

Artificial intelligence effects everything around us. One of the most exciting areas of computer science, this mathematics-forward course introduces the fundamentals of how we develop intelligence in computers and machines.

The aim is creating AI which can learn from experience. This can look like deriving implicit knowledge from provided information, learning to understand natural languages such as English, Arabic, or Urdu, determining the content of images, and ultimately, working together in collaboration. The techniques used in AI are as diverse as the problems tackled: they range from classical logic to statistical approaches to simulate brains.

This course reflects the diversity of the field - combining themes related to AI techniques, including Making Sense of Complex Data and Learning from Data. As you graduate, you not only benefit from the many career options open to those who study the Advanced Computer Science pathway, but are ideally placed to work in positions requiring an understanding of modern AI formalisms and technologies - such as Natural Language Processing and Machine Learning. This includes the obvious positions in the games industry, but also roles in finance, commerce, and scientific research, and many more.

Your lectures and seminars are supported by fascinating practical exercises, designed help you effectively implement your learning. These skills are further put into practice by your MSc project, the perfect opportunity to showcase your impressive rendering of AI techniques and technology.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

D INNOVATING TECHNOLOGY CAREERS

E RESEARCH FOR NEW HORIZONS

WHERE DO OUR GRADUATES WORK?

- Google
- ARM
- Huawei
- PeakAI
- IQVIA
- Amazon
- Academic Research

COURSES IN RELATED SUBJECT AREAS:

MSc Robotics
MSc Digital Biology
MSc Data Science (Mathematics)

WHAT DO OUR GRADUATES DO?

- Data Scientist
- Data Analyst
- Machine Learning Engineer
- Software Developer
- Business Intelligence Analyst
- Project Manager

ENTRY REQUIREMENTS AND PREREQUISITES:

We require a First or equivalent in Computer Science or in a joint degree with at least 50% Computer Science content. Applicants with extensive Computer Science industrial experience and a good honours degree in Computer Science, or its overseas equivalent, may also be considered for admission. We also require that all applicants have a strong background in Computer Science reflected, for example, in solid programming and software development skills.

IELTS: overall score of 7.0 with no sub-test below 6.5

MSC ACS: COMPUTER SECURITY

Read more about this course

If you're looking to specialise in an area with unlimited growth and ever-developing applications, you will find that in Computer Security. As both the home of the first stored program computer and the most sought-after university graduates in the UK (Graduate Market, 2022), there is no better place to complete this MSc.

Setting you on a path to protecting individuals, governments, and organisations who connect to massive stores of shared information online every day, this career is not only ever-developing but in high-demand. Identity thefts, computer hackings, privacy breaches, and technical sabotages - both home and international security attacks now demand increasingly creative minds to stop their spread.

Centred around a core security theme, we equip you with the fundamental topics within the design, analysis, and implementation of networked and distributed systems. To complement this, you can then choose from the subsidiary themes to apply your newly acquired skills in a variety of ways.

Stimulating, challenging, and always rewarding, this pathway is designed for students ready to specialise in security.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

D INNOVATING TECHNOLOGY CAREERS
E RESEARCH FOR NEW HORIZONS

WHERE DO OUR GRADUATES WORK?

- ARM
- Amazon Web Services (AWS)
- BAE Systems (Digital Intelligence)
- HSBC
- HM Revenue and Customs
- Google
- IBM
- Centro Nacional de Metrologia

WHAT DO OUR GRADUATES DO?

- Software Components Programmer
- Cyber Security Analyst
- Software Engineer
- IT Security Engineer
- Security Architect
- IT Security Administrator

COURSES IN RELATED SUBJECT AREAS:

MSc Advanced Computer Science
MSc Data Science (Computer Science Data Informatics)

Our Computer Security MSc is in high demand with employers across a huge spectrum of industry. As in Advanced Computer Science, opportunities exist in fields as diverse as finance, films, and games, pharmaceuticals, healthcare, consumer products, and public services - all areas of business and society. Security plays a role in almost all areas where computers are being used, including, for example, finance, healthcare, consumer products, and public services. Thus, students who have followed the Computer Security pathway will be ideally placed in any of these areas, especially in positions where they need to be aware of security issues and solutions.

ENTRY REQUIREMENTS AND PREREQUISITES:

We require a First from a UK university, or the overseas equivalent, in a Computer Science degree with a minimum of 50% Computer Science content.

Applicants with extensive Computer Science industrial experience and a 2:1 honours degree in Computer Science, or its overseas equivalent, may also be considered for admission. We also require that all applicants have a strong background in Computer Science reflected, for example, in solid programming and software development skills.

IELTS: overall score of 7.0 with no sub-test below 6.5

MSC ACS: DATA AND KNOWLEDGE MANAGEMENT

Read more about this course

With the transition to the information age, data has become both increasingly central and critical to the everyday activities of people across the world. Make sure you're at the forefront of change, on this pathway at Manchester.

You will already know that the efficient management of data and knowledge are key factors not only to the success of almost any enterprise, but also to the successful handling of today's vast amounts of science related data. One example being the the vast amounts of genomic or patient data now available electronically, and how the quality of their management can affect society.

On this MSc, you will take on specialist methods and technologies concerning the management of data and knowledge. On one half, the Data On The Web theme focuses on the design, maintenance, and query processing of both structured and unstructured databases. On the other, the Learning From Data theme covers principles, algorithms and technologies underlying machine learning, probabilistic modelling, and optimisation – all while exposing you to relevant applications.

As part of a vibrant learning schedule, lectures and seminars will be supported by practical exercises that impart skills as well as knowledge. Your skills are then augmented through an MSc project that enables you to put into practice the valuable techniques taught throughout the course.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

C LEADING CHANGE CAREERS
D INNOVATING TECHNOLOGY CAREERS

WHERE DO OUR GRADUATES WORK?

- Accenture
- Amazon
- Astra Zeneca
- HSBC
- Google
- Academic Research
- What do our graduates do?
- Data Analyst
- Data Engineer
- Strategic Coordinator
- Senior Cloud Architect

COURSES IN RELATED SUBJECT AREAS:

MSc Digital Biology
MSc Data Science (Business and Management)
MSc Data Science (Computer Science Data Informatics)

Students following the Data and Knowledge Management pathway have all the career choices and options as described for general Advanced Computer Science. In addition, students of this pathway are ideally placed to work in positions requiring an understanding of modern data and knowledge management tools and technologies. This includes data and knowledge engineering positions where data is stored and managed electronically, i.e., including the finance, retail, and healthcare sector.

ENTRY REQUIREMENTS AND PREREQUISITES:

We require a First from a UK university, or the overseas equivalent, in a Computer Science degree with a minimum of 50% Computer Science content.

Applicants with extensive Computer Science industrial experience and a 2:1 honours degree in Computer Science, or its overseas equivalent, may also be considered for admission. We also require that all applicants have a strong background in Computer Science reflected, for example, in solid programming and software development skills.

IELTS: overall score of 7.0 with no sub-test below 6.5

MSC ROBOTICS

Read more about this course

This course has an extended research option: MSc Robotics with Extended Research
This course is jointly run with the Department of Electrical and Electronic Engineering and the Department of Mechanical, Aerospace and Civil Engineering

Both the birthplace to the modern computer and the first English university to offer an engineering degree, Manchester has always been a changemaker. Now, one of the leading institutions in the field of Robotics, there truly is no better place to specialise in this rapidly developing technology.

From both artificial intelligence and cognitive robotics to sensory feedback, this truly interdisplinary course not only introduces you to fundamental research but its applications. Encompassing nuclear, offshore wind, and both health and social care, our portfolio connects far-ranging scope with significant industry collaborations.

The four strategic themes explored in this course include: a) mechatronics and control; verification, security and trust in autonomous systems; b) human-robot interaction and cognitive robotics; c) artificial intelligence, machine learning and data science; d) ethics and human-centred robotics issues.

A unique opportunity to blend fundamental aspects with robot system design and integration, this course is practically oriented with an emphasis on real-world applications of robotics across various real-life scenarios.

Re. the extended research course: Prior to your summer break a preliminary study and outline of your MSc dissertation project is completed, which is fully developed throughout the second year of your course. The year-long enhanced individual research provides great opportunities to develop advanced research skills and to explore in depth some of the topics discussed during the course. This includes training in research methods, and advanced simulation and experimental techniques in robotics, as well as academic publications.

THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

A ENERGY CAREERS
B BUILDING SUSTAINABLE FUTURES CAREERS
C LEADING CHANGE CAREERS
D INNOVATING TECHNOLOGY CAREERS
E RESEARCH FOR NEW HORIZONS

WHERE COULD OUR GRADUATES WORK?

- Dyson
- Airbus
- Ocado
- Saab
- GE Aviation
- Atkins
- Labman Automation
- Street Drone
- Createc
- Jacobs
- Sellafield
- National Nuclear Laboratory
- Ross Robotics
- Oxbotica

COURSES IN RELATED SUBJECT AREAS:

MSc Artificial Intelligence, EEE Masters Degrees, MSc ACSE,
CS Masters Degrees, MACE Masters Degrees, MSc Aerospace Engineering

WHAT COULD OUR GRADUATES DO?

Graduates from the course will be employed in a variety of industries, from start-ups and supply chain companies through to end users. The adoption of robotics is expanding significantly in areas such as nuclear, offshore-wind, transport infrastructure (rail, highways), logistics, automotive (driverless cars), construction, social-care, manufacturing, healthcare (surgery) and agriculture.

The MSc can also be used a springboard for postgraduate research. There are still many fields within robotics which require significant research to develop further.

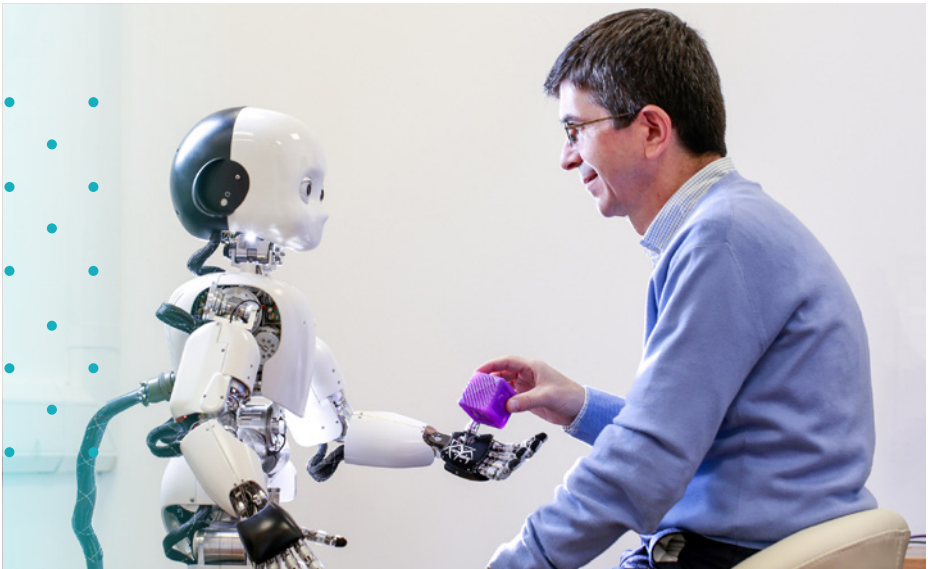
ENTRY REQUIREMENTS AND PREREQUISITES:

We require a good Upper Second Class Honours degree or international equivalent in an electrical and electronic engineering, mechanical engineering, computer science or other related discipline. Candidates from other scientific disciplines are encouraged to apply, provided they can demonstrate strength in mathematics.

Re. extended research course: To progress to the second year of this course, we usually require performance at Distinction level. Students who do not meet the criteria for progression to the second year will instead graduate with the one-year Robotics MSc or an alternative appropriate qualification.

When assessing your academic record, we take into account your grade average with particular emphasis on relevant course units and the standing of the institution where you studied your qualification.

IELTS at least 7.0 overall with no subtest below 6.5.



PRACTICALITIES

PRACTICALITIES - FEES, FUNDING, AND SCHOLARSHIPS

Your master's fees will cover the cost of your study at the University as well as charges for registration, tuition, supervision, examinations, and graduation. Tuition fees also entitle you to membership of our libraries, the Students' Union, and the Athletic Union.

If you require funding for your master's course, it is advised that you begin looking as soon as possible. A range of funding options may be available to you, which will differ depending on whether you are a student from the UK or an international student (including the EU).

Check the tuition fees for your chosen course, your fee status, and funding opportunities by visiting our master's fees and funding webpage.

ACCOMMODATION

For most of you, Manchester won't just be your next stage of education; it'll be your new home for a year or more. From the moment you arrive, you'll be able to access support to help you make the most of your time in university accommodation. You'll find a range of accommodation options for postgraduate students, from contemporary and traditional halls of residence to a specialist advice service for those interested in private letting.

An offer of residence in university accommodation is guaranteed to all overseas postgraduate students for the duration of their studies, provided they meet conditions related to offer holder status and study mode. If your application falls outside the conditions of the guarantee, you are still welcome to apply for university accommodation.

Find out more on the accommodation website or explore our interactive map.

This brochure was created in 2022/2023. It has therefore been created in advance of course starting dates and for this reason, course information may be amended prior to you applying for a place. There are a number of reasons why changes to course information and/or published term dates may need to be made prior to you applying for a place – more details can be found on our website. Prospective students are therefore reminded that they are responsible for ensuring, prior to applying to study, that they review up-to-date course information by searching for the relevant course at: manchester.ac.uk/study/masters/courses/

Further information describing the teaching, examination, assessment, and other educational services offered by The University of Manchester is available at: manchester.ac.uk/study/masters/

Royal Charter Number RC000797

pgt-compsci@manchester.ac.uk
cs.manchester.ac.uk/
@computersciencemcr
@csmcr
@uomcompsci
UoMCompsci
mub.eps.manchester.ac.uk/compsci/

The University of Manchester
Department of Computer Science
Kilburn Building
Oxford Road
Manchester
M13 9PL
United Kingdom

Tel: +44 (0) 161 543 4018