

**1. Programme title(s) and code(s)**

Two-year MSc (incl Postgraduate Diploma and Postgraduate Certificate as exit awards) in

- Advanced Computer Science
- Advanced Computer Science with Industry

**Notes**

[HECOS Code](#)

HECOS Code	%
100366	100%

**2. Awarding body or institution**

University of Leicester

**3. a) Mode of study**

Full-time

**b) Type of study**

Campus-based

**4. Registration periods****a) MSc October Intake**

The normal period of registration is 24 months

The maximum period of registration is 36 months

**b) MSc (with industry)**

The normal period of registration is 36 months

The maximum period of registration is 48 months

**5. Typical entry requirements**

These programmes will only be open to students who have passed an equivalent of the second year of our BSc Computer Science at an institution that the College of Science & Engineering has a collaborative agreement with: such an agreement will typically take one of two forms.

(i) A general agreement where students that have passed an equivalent year to the Leicester second year can apply for admission to the proposed two-year MSc at Leicester. In this case, the admissions team in cooperation with the programme leader will evaluate if the applicant's prior achievements cover the learning outcomes required as prerequisites for the third, final year, of the UoL BSc Computer Science programme.

(ii) In a more specific arrangement, some of the partner Bachelor programmes are considered and at the agreement discussion stage and are listed in the collaboration

documents. Module content details and learning outcomes will already have been reviewed. In this case an individual assessment of modules for each application will follow a more light touch approach to ensure the applicant has taken the required modules and achieved the necessary marks/CGPAs.

We will require a level of prior achievement equivalent to an average of 60% or higher at Leicester, suitably translated into the corresponding score for candidates' home institution. In particular candidates need to be fluent in object-oriented programming, particularly Java and Python, common software engineering methods, processes and practices, basic statistics and discrete mathematics.

Where English is not the first language of the candidate, the successful applicant must have IELTS 6.0.

## **6. Accreditation of Prior Learning**

N/A

## **7. Programme aims**

The aims of the programme are to:

- Develop a deep understanding of the nature and impact of current challenges faced by the IT industry, so that students know what is expected from them as mature professionals.
- Develop an awareness of the methodologies and technologies that are available within computer science to address these challenges, so that students can evaluate and analyse specific situations and make informed choices.
- To foster confidence, convey knowledge and develop practical skills in the use of some of these technologies, including both fundamental concepts and state-of-the-art support tools.
- Encourage students to develop their interpersonal, communication, decision-making, and problem-solving skills, and to use these in an imaginative way.
- Provide experience of both team-based and individual project work.
- Secure knowledge and research skills so that students are able to take their studies further to do a PhD, in case they complete the full MSc.

The 'with industry' variant of this programme is offered in accordance with the University's [standard specification for with industry programme variants](#).

For the with industry variant only, these additional programme aims apply:

- Prepare students for career and training opportunities which relates to their degree – in both the private and public sectors, and voluntary organisations.
- Construct effective applications for placement opportunities
- Provide students the opportunity to recognise suitable plans for transitioning into the workplace
- To provide experience of applications of professional and discipline-specific skills in Industry and to reinforce knowledge through its use in different environments.

## **8. Reference points used to inform the programme specification**

- [QAA Benchmark Computing](#)
- QAA Frameworks for Higher Education Qualifications in England Wales and Northern Ireland
- QAA [Master's Degree Characteristics](#)

- Periodic Developmental Review report
- [University Education Strategy](#)
- [University Assessment Strategy](#) [log in required]
- University Employability Strategy
- Graduate Survey
- First Destination Survey
- External Examiner's Reports

## 9. Programme Outcomes

Unless otherwise stated, programme outcomes apply to all awards specified in 1. Programme title(s).

### a) Discipline specific knowledge and competencies

#### i) Knowledge

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Demonstrate knowledge and mastery of a range of advanced computer science subjects and the way they relate to IT practice. Integration of knowledge across subjects.	Independent research, lectures, and the seminar/discussion groups that are part of the Personal and Group Skills module.	Written examinations, oral presentations, participation in group discussions, essays/demos, project planning and dissertation.

#### ii) Concepts

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Demonstrate enhanced grasp of principles of computer science methodology and technology.	Independent research, lectures, seminars, group-discussions.	Written examinations, assessed coursework, group essays, oral presentations, dissertation and reports.

#### iii) Techniques

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Master advanced modelling and design techniques for the development of distributed, software intensive, and web- based systems.	Independent research, lectures, seminars, group-discussions, along with laboratory work and individual project.	Written examinations, assessed coursework, group essays, oral presentations, dissertation and reports.
Engineer and follow software development processes, make use of model-based techniques, target service-oriented architectures.	As above.	As above.

<b>Intended Learning Outcomes</b>	<b>Teaching and Learning Methods</b>	<b>How Demonstrated?</b>
Use problem-solving techniques, and select and apply suitable technologies in different application areas.	As above.	As above.
Apply current technologies in distributed systems engineering.	As above.	As Above.
Master research methods and project planning techniques.	Personal and Group Skills module, and individual project.	Individual project components; group discussions and essays.

iv) Critical analysis

<b>Intended Learning Outcomes</b>	<b>Teaching and Learning Methods</b>	<b>How Demonstrated?</b>
Apply understanding of concepts and techniques with independence, rigour & self-reflexivity.	Independent research, lectures, Personal and Group Skills module, and individual project.	Oral presentations, participation in group discussions, essays/demos, project plan, dissertation, and work placement report.
Critically appraise problem solutions, and project work. Demonstrate consideration of professional issues.	As above.	As above.

v) Presentation

<b>Intended Learning Outcomes</b>	<b>Teaching and Learning Methods</b>	<b>How Demonstrated?</b>
Organise research material and/or technology demonstration; distinguish between relevant and non-relevant material; write-up and deliver oral reports on findings to a professional standard; engage in scientific discussion with peers.	Lectures, seminars, group discussions. Personal and Group Skills module. Work placement.	Oral presentations, participation in group discussions, essays/demos, project plan, and dissertation.

vi) Appraisal of evidence

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Analyse and assess a variety of requirements for system development and/or engineering. Assess the relevance and quality of proposed methods, techniques and technologies. Mount and sustain an independent level of inquiry at an advanced level.	Independent research, lectures, seminars, group-discussion, and the Personal and Group Skills module.	Oral presentations, participation in group discussions, essays/demos, project plan, and dissertation.

**b) Transferable skills**

i) Research skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Conduct significant background research and literature surveys, organise and marshal evidence, report on findings, analyse complex ideas and construct sophisticated critical arguments.	Project supervision. Seminars, group discussions, collective essay, and specific workshops delivered by Student Learning Development.	Collective essay, group discussions, and individual project reports and dissertation.

ii) Communication skills

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Respond to scientific questions with accurate and concise answers. Demonstrate fluent and sustained scientific and technical communication.	Lectures, seminars, moderated group discussions, and individual project supervision. Workshops delivered by Student Learning Development.	Group discussions and individual project presentations, individual project oral examinations, presentation.
Write concise and accurate summaries of scientific knowledge, and solutions to problems, in a variety of different formats.	Lectures. Detailed solutions provided in problem classes. Workshops delivered by Student Learning Development. Individual project supervision.	Written examinations, assessed coursework, group essay, intermediate individual project reports and dissertation.
Produce properly structured, clear, advanced technical reports or dissertations.	As above.	Group essay. Intermediate individual project reports and dissertation.

iii) Data presentation

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Organise and present information gathered through research clearly and effectively using appropriate IT resources.	Independent research. Lectures. Workshops delivered by Student Learning Development.	Oral presentations, essays/demos, work placement report, and dissertation.

iv) Information technology

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Use of software development tools across different languages and environments, including the ability to set up and configure them as required.	Lab based instruction and independent research. Work placement.	Coursework and lab-based demos. Dissertation. Work placement.
Ability to use online tools for independent research and collaboration.	Workshops delivered by the Student Learning Centre.	Coursework and dissertations.

v) Problem solving

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Discovering, querying and resolving ambiguities in requirements.	Lab based instruction and independent research. Work placement.	Coursework and lab-based demos. Dissertation. Work placement.
Testing, debugging and correcting code. Troubleshooting technical problems.	Lab based instruction and independent research. Work placement.	Coursework and lab-based demos. Dissertation. Work placement.

vi) Working relationships

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Know how and when to draw on the knowledge & expertise of others; contribute and comment on ideas in syndicate groups.	Lectures. Group discussions and collective essay.	Oral presentations, participation in group discussions, work placement report.

vii) Managing learning

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Demonstrate independence and time management skills.	Tutor system. Career development workshop delivered by the Student Learning Development.	Meeting coursework deadlines. Collective essay.
Identifying a credible research project, drawing up a realistic research timetable, reflecting on and 'writing up' results. Design a long-term personal career plan.	Project supervision.	Individual project topic choice and plan, intermediate reports and dissertation.

viii) Career management

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
Plan personal professional development, understand how to prepare for job market and how to apply for employment.	Career development workshop	Personal Tutor meetings. Obtaining placement ("with Industry")

[For the Year in Industry variant, the additional programme outcomes apply](#)

## 10. Special features

The core module Personal and Group Skills combines group discussions and collective essay writing with individual presentations, supported by a series of workshops on transferable skills and career planning. The aim is to learn how to define, scope and develop a research project in preparation for the individual final project.

The department is research active in all areas covered by the programmes, which means that students will be able to benefit from the projects that are going on through special lectures, tutorials and discussions with national and international collaborators, as well as being able to conduct their projects in topics that are at the cutting edge of science and technology. The areas covered by the programmes are directly related to the specific research strength in the department.

The University recognises that undertaking a work placement as part the programme of study can enhance career prospects and provide added value, and as such this programme includes a 'with industry' variant.

By experiencing real-world scenarios and applying skills and knowledge to a professional environment, students can gain a unique insight into how their studies can be utilised in industry. This will not only showcase their abilities to future employers but will also enhance their studies upon returning to university to complete your programme.

To understand the special features for 'with industry' postgraduate programme variants, this programme specification should be read in conjunction with the [programme specification content which can be found here](#). This outlines details including programme aims, support, progression and duration.

## 12a. Research-inspired Education

Students on this programme will advance through the four quadrants of the University of Leicester Research-inspired Education Framework as follows:

RiE Quadrant	Narrative
<p><b>Research-briefed</b></p> <p>Bringing staff research content into the curriculum.</p>	<p>The general aims of the programme are to help develop a deep understanding of the nature and current challenges faced by the IT industry, so that students know what is expected from them as mature professionals. Additionally, it aims to provide experience of both team-based and individual project work, and secure knowledge and research skills so that students are able to take their studies further to do a PhD.</p> <p><i>Research-briefed:</i> Students will develop an awareness of the methodologies and technologies that are available within computer science to address these challenges, so that students can evaluate and analyse specific situations and make informed choices. The areas covered by the programmes are directly related to our internationally recognised research strengths, in the areas of model-based development, data analysis and AI, algorithms, and HCI.</p>
<p><b>Research-based</b></p> <p>Framed enquiry for exploring existing knowledge.</p>	<p><i>Research-based:</i> During computer labs, students will have an opportunity to put their problem-solving and research skills into practice in applications to data analysis, machine learning, AI, and more.</p>
<p><b>Research-oriented</b></p> <p>Students critique published research content and process.</p>	<p><i>Research-oriented:</i> In their final projects and throughout the degree, students will search information on their subject domain, organise and present it in literature surveys. Students will also evaluate the outcomes of their project, including its social, legal and ethical considerations.</p>
<p><b>Research-apprenticed</b></p> <p>Experiencing the research process and methods; building new knowledge.</p>	<p><i>Research-apprenticed:</i> Students will undertake an individual project on an approved topic, leading to the submission of a dissertation. The project is expected to contain elements of original work and may involve informal collaboration with other organisations, such as external clients.</p>

**As part of studying at a research-intensive university, students on this programme have the following extra or co-curricular opportunities available to them to gain exposure to research culture:**

The School helps organise multiple Hackathons during the academic year where the students can come together and collaboratively work or build new software. These Hackathons often have industrial partnerships and collaborators, for example IBM and Capital One. Students are informed and invited to participate in these events via emails.

Students can apply to join the DriverLeics group, which was invited to demonstrate autonomous technologies at the Royal Society Summer Science Exhibition. Successful candidates will engage in research-inspired learning activities in autonomous systems, such as robotics and autonomous vehicles. They will also have opportunities to participate in national and international competitions, such as F1Tenth, and take part in local outreach and voluntary STEM activities. Throughout term, subject specific career drop-in sessions are scheduled (and added to the students' timetable), in order for students to find out more about the subject and research specific paths in Computer Science.

**Teaching on this programme will be research-informed (it draws consciously on systematic inquiry into the teaching and learning process itself) in the following way:**

The School supports all staff involved in teaching to gain an accredited Higher Education teaching qualification, in which they demonstrate their use of teaching theory to support their own practice and reflect on their current teaching and continuing professional development.

All module convenors are part of teaching pods, which group similar fields together. These pods are designed to provide a forum for discussion between teaching-focussed and teaching/research staff, and as a way for more experienced staff to support others by, for example, peer observation and feedback. This provides a platform for staff to share considerations and observations of their teaching experience and obtain research-based input.

Teaching staff meet once a year for a 'Teaching Away Day', which gives the opportunity to discuss some key issues in depth with the other members within the teaching pods, and shared with everyone. This gives a chance to share ideas and experience, and to identify questions that need answers.

Additionally, staff will be paired within their teaching pods to observe each other's teaching sessions then meet to agree actions in order to participate in UoL's Peer Observation of Teaching scheme.

## **11. Indicators of programme quality**

QAA subject review, external examiners reports, periodic developmental reviews, module review process including student surveys are all used to reflect on and improve the curriculum design and the methods and quality of delivery. The BSc component has been accredited by the British Computer Society (BCS). It requires that individual projects be passed at the first attempt.

[For the Year Industry variant the additional indications of programme quality apply](#)

## **12. Criteria for award and classification**

This programme follows the standard scheme of taught postgraduate award and classification set out in [Senate Regulations](#) – the first year of this programme follows the undergraduate scheme of assessment and classification as set out in Senate Regulation 5. The second year follows the assessment and awards procedures for postgraduate programmes in Senate Regulation 6.

Students who have passed the first year of the program, but have not met the Learning Outcomes for the award of an MSc, can be awarded a postgraduate diploma or postgraduate certificate as an exit award according to the rules set out for these awards in Senate Regulation 6 (Criteria for and classification of awards).

### 13. Progression points

As defined in [Senate Regulations](#) - refer to the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

To progress from the 1<sup>st</sup> to the 2<sup>nd</sup> year of the programme, students normally have to achieve a credit weighted average of 60%, with the option to consider borderline cases and special circumstances.

Before starting to study the Leicester first year modules, the student and home institution agree the study programme (including any option module selections). After completing their first year at Leicester, students will receive a Leicester transcript in the normal way. This transcript will then be submitted by the student to the student's home university for consideration as part (the final year) of the home university Bachelor degree programme.

Candidates entitled to proceed to a full MSc degree undertake, after examinations, an individual project.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course and a recommendation will be made to the Board of Examiners for an intermediate or exit award where appropriate.

[For the 'with Industry' variants these additional progression points apply](#)

### 14. Rules relating to re-sits or re-submissions

As defined in [Senate Regulations](#) - The first year of the programme will follow the rules for resits and resubmissions for undergraduate degrees as defined in Senate Regulation 5. The second year follows the rules and procedures for postgraduate programmes in Senate Regulation 6.

Resits may only be taken when the exam for the module to be resat is offered again.

The following modules have restrictions on the assessment components that can be reassessed:

- CO7210
- CO7201

Please refer to the [module specification](#) for full details.

### 15. External Examiners reports

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports for this programme can be found at [exampapers@Leicester](mailto:exampapers@Leicester) [log-in required]

### 16. Additional features (e.g. timetable for admissions)

Admissions are in October into the final year of the BSc in Computer Science. After completing this, their 1st year with us, students will progress to the MSc in Advanced Computer Science or MSc in Advanced Computer Science (with Industry) as their 2nd year. In the first case, they will undertake their MSc individual project during the summer of their second year and submit their dissertation in September (24 months in total). In the second case, the project will be undertaken during the term following their return from placement.

Examinations are taken in January for first semester modules and in May for second semester modules.

In line with the other MSc offerings in the Department of Informatics, in the MSc year there are three kinds of modules in the MSc programmes. Details of the modules, including the semesters when they are delivered are shown in the module listing below.

### **Personal and Group Skills (PGS) (15 credits)**

This module is offered in both semesters and provides students with skills supporting their employability. Students attend a series of seminars given by researchers from universities or companies followed by group discussions moderated by a member of staff. Each group prepares a joint essay based on the seminar and the discussions. Students also attend workshops organised by the Student Learning Centre on topics like project planning, writing and presentation skills, as well as career management.

### **Taught Modules (105 credits)**

Taught modules are taken to a total of 105 credits of optional modules as indicated in the module listing below.

Optional modules are chosen, with the approval of the personal tutor, before the end of the second teaching week of each semester. Some optional modules may have pre-requisites (e.g. experience in certain programming languages or mathematical maturity) and, therefore, inadvisable to certain students. Any such pre-requisite will be explicitly stated in the corresponding module form available in the student's handbook.

Students are not allowed to take MSc level variants of modules that they have already taken at 3<sup>rd</sup> year level. In particular, this includes

- CO7002 as a variant of CO3002
- CO7091 as a variant of CO3091
- CO7093 as a variant of CO3093
- CO7095 as a variant of CO3095
- CO7099 as a variant of CO3099
- CO7102 as a variant of CO3102
- CO7105 as a variant of CO3105
- CO7113 as a variant of CO3113

### **Individual Project (60 credits)**

Candidates entitled to proceed to a full MSc degree undertake, after examinations, an individual project on an approved topic according to the profile of each course, leading to the submission of a 15,000 word dissertation. The project is expected to contain some element of original work, and may involve informal collaboration with other organisations, subject to the previous approval of the project supervisor.

## Programme Specification (Postgraduate)

FOR ENTRY YEAR: 2026/27

Date created: n/a

Last amended: 18/03/2026

Version no. 1

### Appendix 1: Programme structure (programme regulations)

The University regularly reviews its programmes and modules to ensure that they reflect the current status of the discipline and offer the best learning experience to students. On occasion, it may be necessary to alter particular aspects of a course or module.

#### Updates to the programme

Academic year	Module	Change
2026/27	CO3099 Cryptosystems	Previously <i>Foundations of Cybersecurity</i>
2027/28	MA7911 Network Science	New optional module
2027/28	CO7262 AI Security, Ethics, and Management	New optional module
2027/28	CO7263 Quantum Machine Learning	New optional module

### MSc Advanced Computer Science (2 Year Programme)

Level 6/Year 3      2026/27

#### Credit breakdown

Status	Year long	Semester 1	Semester 2
Core	45 credits	15 credits	n/a
Optional	n/a	30 credits	30 credits

120 credits in total

### Core modules

Delivery period	Code	Title	Credits
Year long	CO3201	COMPUTER SCIENCE PROJECT	45 credits
Sem 1	CO3101	COMPUTERS, SOCIETY & PROFESSIONALISM	15 credits

### Notes

N/A

### Option modules

Delivery period	Code	Title	Credits
Semester 1	CO3091	COMPUTATIONAL INTELLIGENCE AND SOFTWARE ENGINEERING^	15 credits
Semester 1	CO3095	SOFTWARE MEASUREMENT AND QUALITY ASSURANCE^	15 credits
Semester 1	CO3102	MOBILE AND WEB APPLICATIONS^	15 credits
Semester 1	CO3105	C++ PROGRAMMING^	15 credits
Semester 1	CO3219	INTERNET AND CLOUD COMPUTING^	15 credits
Semester 2	CO3002	ANALYSIS AND DESIGN OF ALGORITHMS^	15 credits
Semester 2	CO3093	BIG DATA AND PREDICTIVE ANALYTICS^	15 credits
Semester 2	CO3099	CRYPTOSYSTEMS ^	15 credits
Semester 2	CO3103	TECHNOLOGY AND INNOVATION MANAGEMENT^	15 credits
Semester 2	CO3111	FUNCTIONAL PROGRAMMING	15 credits
Semester 2	CO3113	AI FOR SPACE^	15 credits

### Notes

Choose 30 credits of options in each semester.

Level 7/Year 2      2027/28

### Credit breakdown

Status	Year long	Semester 1	Semester 2	Other delivery period
Core taught	n/a	15 credits *	n/a	n/a
Optional	n/a	45 credits	60 credits	n/a
Dissertation/project	n/a	n/a	n/a	60 credits

180 credits in total

### Core modules

Delivery period	Code	Title	Credits
Term 3	CO7201	Individual Project	60 credits
Semester 1	CO7210	Personal and Group Skills*	15 credits
Semester 2	CO7210	Personal and Group Skills*	15 credits

\* Students must take CO7210, but can take it in either Semester 1 or 2. The figures in the credit breakdown table assume CO7210 is taken in Semester 1.

Students on a 'with industry' degree will take CO7201 Individual Project after their industry placement is complete.

### Option modules

Delivery period	Code	Title	Credits
Semester 1	CO7091	Computational Intelligence and Software Engineering^	15 credits
Semester 1	CO7095	Software Measurement and Quality Assurance^	15 credits
Semester 1	CO7102	Mobile and Web Applications^	15 credits
Semester 1	CO7105	Advanced C++ Programming^	15 credits

<b>Delivery period</b>	<b>Code</b>	<b>Title</b>	<b>Credits</b>
Semester 1	CO7217	Agile Cloud Automation	15 credits
Semester 1	CO7219	Internet and Cloud Computing^	15 credits
Semester 1	CO7223	User Experience and Interaction Design	15 credits
Semester 1	CO7224	Mobile and Ubiquitous Computing	15 credits
Semester 1	MA7077	Operational Research	15 credits
Semester 1	MA7911	Network Science	15 credits
Semester 1	CO7262	AI Security, Ethics, and Management	15 credits
Semester 2	CO7263	Quantum Machine Learning	15 credits
Semester 2	CO7103	Technology and Innovation Management^	15 credits
Semester 2	CO7002	Analysis and Design of Algorithms^	15 credits
Semester 2	CO7093	Big Data and Predictive Analysis^	15 credits
Semester 2	CO7099	Foundations of Cybersecurity^	15 credits
Semester 2	CO7113	AI for Space^	15 credits
Semester 2	CO7200	Algorithms for Bioinformatics	15 credits
Semester 2	CO7207	Generative Development	15 credits
Semester 2	CO7214	Service Oriented Architectures	15 credits
Semester 2	CO7225	Service Design	15 credits

#### Core modules

<b>Delivery period</b>	<b>Code</b>	<b>Title</b>	<b>Credits</b>
Term 3	CO7201	Individual Project	60 credits

**Notes**

^ Modules marked with this symbol are available in both the first and second year of the course, and cannot be taken twice.

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

**Appendix 2: Module specifications**

See taught postgraduate [module specification database](#) [log in required]. (Note - modules are organized by year of delivery).