



**UNIVERSITY
OF LONDON**

Programme Specification 2022–2023

Computer Science

MSc
PGDip
PGCert
Individual modules

Important document – please read

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Important information regarding the Programme Specification

About this document

Last revised 18 March 2022

The Programme Specification gives a broad outline of the structure and content of the programme, the entry level qualifications, as well as the learning outcomes students will achieve as they progress. Some of the information referred to in this programme specification is included in more detail on the University of London [website](#). Where this is the case, links to the relevant webpage are included.

Where links to external organisations are provided, the University of London is not responsible for their content and does not recommend nor necessarily agree with opinions expressed and services provided at those sites.

If you have a query about any of the programme information provided, whether here or on the website, registered students should use the 'ask a question' button in the [student portal](#). Otherwise, the *Contact Us* link at the bottom of every webpage should be used.

Terminology

The following language is specific to the **Computer Science** programme:

Module: Individual units of the programme are called modules. Each module is a self-contained, formally structured learning experience with a coherent and explicit set of learning outcomes and assessment criteria

Key revisions made

Programme specifications are revised annually. The quality committee of the member institution providing academic direction, as part of its annual review of standards, confirms the programme structure and the educational aims and learning outcomes, and advises on any development in student support. Where there are changes which may impact on continuing students, these are listed below. For all new students, the programme and general information provided in this document is correct and accurate and will be applicable for the current year.

Programme title and qualifications

Postgraduate Degrees of the University of London may be classified. The award certificate will indicate the level of the academic performance achieved by classifying the award. The classification of the degree will be based on the ratified marks from the completed assessments.

The classification system for the MSc, Postgraduate Diploma and Postgraduate Certificate in Management is as follows:

Distinction; Merit; Pass.

Specific rules for the classification of awards are given in the [Programme Regulations](#), under Scheme of Award

Programme title

Computer Science

Qualifications

Master of Science in Computer Science

Postgraduate Diploma in Computer Science

Postgraduate Certificate in Computer Science

Intermediate qualifications

Students may not normally receive an intermediate qualification if continuing to a higher qualification, even if they are registered on the intermediate qualifications.

Exit qualifications

Postgraduate Diploma in Computer Science

Postgraduate Certificate in Computer Science

An exit qualification is an intermediate qualification, as noted above, for which the student may not have registered at the outset but which may be awarded on completion of specific modules/courses (or credit accumulated) in a longer programme of study, if the student leaves the programme. Exit qualifications are awarded at the discretion of the Board of Examiners and once a student has accepted an exit qualification they will not normally be permitted to continue their study of the same programme with the University of London.

Individual modules available for study on a stand-alone basis

There is also provision for select individual modules of the programme to be studied on a stand-alone basis without being registered for a related qualification, with the exception of the Project. Only three modules (a maximum of 45 credits) may be counted as credit towards a related qualification. Neither progression nor credit is automatic.

Award titles may be abbreviated as follows:

Master of Science – MSc

Postgraduate Diploma – PGDip

Postgraduate Certificate – PGCert

University of London

Level of the programmes

The Framework for Higher Education Qualifications of UK Degree-Awarding Bodies (FHEQ) forms part of the UK Quality Code for Higher Education of the [Quality Assurance Agency for Higher Education](#) (QAA).

The awards are placed at the following Levels of the Framework for Higher Education Qualifications (FHEQ):

MSc	Level 7
PGDip	Level 7
PGCert	Level 7

Relevant QAA subject benchmarks group

See the [QAA website](#) for information about quality assurance.

[Computing \(Master's\)](#)

Awarding body

University of London

Registering body

University of London

Academic direction

Birkbeck, University of London

Accreditation by professional or statutory body

As part of the development of the MSc Computer Science programme, requirements set out by a number of relevant professional bodies are being reviewed and accreditation will be sought at launch.

Language of study and assessment

English

Mode of study

Web supported learning with an online tutor.

Programme structures

The programme has two registration points in the year: October and April. There are four study sessions in a year, each lasting 10 weeks. Sessions begin in October, January, April and July. Each session is followed by an assessment submission point.

Students have an online induction session available through the virtual learning environment (VLE) prior to the start of their study session. This includes orientation of their learning environment and guidance on the structure and learning expectations for the module.

The **MSc Computer Science** is a 180 UK credit degree programme consisting of:

- Ten compulsory modules (15 credits each): and
- One compulsory Project (30 credits)

The **PGDip Computer Science** is a 120 UK credit degree programme consisting of:

- Eight modules (15 credits each)

The **PGCert Computer Science** is a 60 UK credit degree programme consisting of:

- Four modules (15 credits each)

Maximum and minimum periods of registration

The maximum and minimum period of registration, from a student's effective date of registration, are:

	Minimum*	Maximum
MSc	Two years	Five years
PGDip	One and a half years	Five years
PGCert	Six months	Five years

*The minimum period of registration is subject to module availability and modules will be launched on a rolling basis from October 2021 onwards. Based on the current module release schedule, if commencing studies in April 2022, it is expected that the PGCert will take a minimum of one year to complete.

In making a decision as to how many modules to register for in a given session, it is important to take account of on-going work and/or personal commitments.

Credit value of modules

Further information about the credit systems used by universities in the UK and Europe is provided by the [Quality Assurance Agency](#) and the [European Credit Transfer and Accumulation System](#).

Where credits are assigned to modules of a programme, credit indicates the amount of learning carried out in terms of the notional number of study hours needed, and the specified Framework for Higher Education Qualifications in England (FHEQ) credit level indicates the depth, complexity and intellectual demand of learning involved. The details below indicate the UK credits and the European Credit Transfer and Accumulation System (ECTS) values.

The MSc Computer Science comprises a total of 180 UK credits (90 ECTS credits) at FHEQ level 7.

The PGDip Computer Science comprises a total of 120 UK credits (60 ECTS credits) at FHEQ level 7.

The PGCert Computer Science comprises a total of 60 UK credits (30 ECTS credits) at FHEQ level 7.

Recognition of prior learning

Recognition of prior learning is a generic term for the process by which we recognise and, where appropriate, award credit for learning that has taken place at an institution other than the University of London. Where the prior learning covered a similar syllabus to a module/course on the University of London programme, credit will be awarded as if you took the University of London module/course.

See the [General Regulations](#) (Section 3) and [Programme Regulations](#) for more rules relating to prior learning.

MSc and PGDip students may apply for recognition of prior learning mapped against modules to a total of 60 UK credits. Applications for recognition of prior learning for the Project will not be accepted. PGCert students may not apply for recognition of prior learning.

Entrance requirements

Applicants must submit an application in line with the procedures and deadlines set out on the website.

Entrance requirements for the MSc and PGDip

To qualify to register for the MSc or PGDip, applicants will need a bachelor's degree which is considered at least comparable to a UK second class honours degree from an institution acceptable to the University.

Entrance requirements for the PGCert

If applicants do not meet the MSc and PGDip entrance requirements, successful completion of the PGCert will allow progression to the MSc or PGDip.

To qualify to register for the PGCert, applicants will need:

Either, a bachelor's degree which is considered at least comparable to a UK second class honours degree from an institution acceptable to the University;

Or, a minimum of two years' work experience in a relevant field. This will most commonly be in a software engineering role but each application will be considered on a case-by-case basis.

Entrance requirements for stand-alone individual modules (if available)

To qualify to register for a stand-alone individual module, applicants will need:

Either, a bachelor's degree which is considered at least comparable to a UK second class honours degree from an institution acceptable to the University;

Or, a minimum of two years' work experience in a relevant field. This will most commonly be in a software engineering role but each application will be considered on a case-by-case basis.

English language requirements

All applicants must satisfy the English language requirements for the programme. These are set out in detail on the programme page under [Entry Requirements](#).

Applicants who have not met any of the above must have passed, within the past three years, a test of proficiency in English language, from an organisation acceptable to the University. This standard must be reached before registering for the MSc.

Further information on English language proficiency tests can be found on our [website](#).

Internet access and computer specification

Students will require regular access to a computer with an internet connection to use the University of London's online resources and systems.

Students must be able to download and install software to their Windows or MacOS device to include secure examination browsers for online assessment purposes (if offered on your programme of study)

The computer must have at least the following minimum specification:

- Windows: 7, 8, and 10 on 64-bit platforms (Windows 10 recommended)
- macOS: OS X 10.14 and higher
- CPUs newer than 2011 (Intel Sandy Bridge or newer)
- OpenGL 2.0 graphics driver
- Local storage for the recording of proctored examinations (75MB per hour)
- Web camera & microphone (internal or external)
- A broadband internet connection (minimum of 0.15Mbps upload speed)

and the following applications installed:

- a word processor that accepts Microsoft Word formats (.doc and .docx)
- a PDF reader
- Microsoft Excel which can run macros
- a presentation program that supports Microsoft PowerPoint

Additional hardware capabilities and software for specific modules will be required, such as:

- Video and audio recording.
- Programmer's text editor such as Atom or Visual Studio and an integrated development environment software (IDE) such as IntelliJ.
- Additional software: including software development kits for example Anaconda for python and the Java SDK, databases such as Mysql, web server such as Apache Tomcat and network analysis tools such as Wireshark.
- Access to hardware: Android or iOS device; microcontrollers such as Arduino; and additional networking elements such as routers and protocol service endpoints.

Finally, students will be required to create and use free accounts on several online services including but not limited to github, Amazon Web Services Educate, Google Cloud Engine and Google Collaborate and Oracle Academy.

Students with specific access requirements

The University of London welcomes applications from disabled students and/or those who have access requirements. The University will make every effort to provide reasonable adjustments to enable those with a disability, learning difficulty or access requirements to have the same opportunity as all other students to successfully complete their studies.

The University is committed to managing the application procedure and the programme itself to ensure that services are accessible for all students and that an inclusive environment is created. Students with a disability, or others who may need access arrangements to assist in taking examinations, should complete the relevant section of the application form, or contact the [Inclusive Practice Manager](#). A separate room or other arrangements may be considered.

Requests are considered by a University panel, whose purpose is to ensure that students with disabilities and/or specific access requirements are neither advantaged nor disadvantaged by such arrangements when compared with other students. These considerations remain separate from the academic selection processes.

For further information, see [Inclusive Practice Policy](#)

Sources of funding and scholarships

Information about potential sources of funding and scholarships is updated annually and where available is included in the prospectus web pages.

For further information see the [website](#).

Educational aims and learning outcomes of the programmes

Programme aims

The MSc Computer Science provides an intensive course in computing for graduates of other subjects.

As well as gaining a broad knowledge of the subject, students acquire practical skills and have the opportunity to investigate certain areas of current research more deeply. For students who are new to the subject, it provides a foundation for a career in IT; for those already working in IT, it provides an opportunity to broaden their knowledge and update their skills while obtaining a formal qualification.

Holders of the MSc will have demonstrated:

- A systematic understanding and a critical awareness, much of it at the forefront of the discipline
- A comprehensive and practical understanding of applicable techniques
- Originality in the application of knowledge
- The ability to evaluate current research and methodologies
- The independent learning ability required for continuing professional development.

Learning outcomes (MSc Computer Science)

A student is expected to:

A Knowledge and understanding:

- Demonstrate a knowledge of:
 - core programming principles including variables, statements, data structures, and functions.
 - mathematical and algorithmic foundations of computing and data management
 - the concepts related to object-oriented and functional programming
 - information and network security, and data protection policies and regulations
 - the legal, ethical, and social implications of information system design decisions
 - database architecture, design, storage, and management
 - software engineering, design, testing, and deployment of small and large scale software applications
 - computer architecture and operating systems including hardware components, and the querying of data stored temporary in-memory or long-term through data storage and management
 - local network and distributed systems architecture, and their associated communication protocols
 - machine learning architectures, methods, and techniques
 - information modelling in computing and their application to different types of data and processes
 - commercial, economic, and social implications of computing applications and techniques
 - the fundamental models of computation, computer arithmetic and logic
 - Information System and Information Technology career paths

B Cognitive skills

- Demonstrate the ability to:
 - apply algorithmic thinking to solve a specific task and to convert this into executable program code
 - identify and correct both logical and syntactic bugs in a software program for a specific programming language
 - design, implement, and deploy principles of database and information systems
 - demonstrate self-direction, creativity, and originality in tackling and solving computational problems, including at scale
 - apply reasoning through abstract concepts and demonstrate abstraction skills in applying computational methods to solve problems
 - plan, execute, and complete a substantial project involving independent study over several months

- act autonomously in planning, solving, and implementing computational tasks at a professional level
- conduct a critical analysis of professional articles, and research papers
- communicate design decisions, approaches, and solutions with clarity to both specialist and non-specialist audiences
- identify the social, legal, ethical, and organisational implications of the use of computers
- compare and evaluate a range of computational methods and techniques to analyse data and information systems and identify the benefits and short-comings of each approach with confidence
- recognise the efficiency and resource requirements of computational techniques, including the organisational and environmental factors

C Practical and professional skills

- Demonstrate the ability to:
 - implement computer code in a programming language including Python, Java, and C#
 - implement a computer program in an object-oriented programming language to perform a calculation from a software specification.
 - implement the SQL data-manipulation language to create, query, and manipulate data
 - create and document a design using UML approaches and software tools
 - use a coherent information system development process to solve a problem
 - gain experience of applying network and cloud computing technologies
 - implement appropriate algorithms and data structures in sequential and parallel environments
 - apply allocation techniques in software design and implementation to manage computational resources effectively
 - compare different approaches and make informed decisions on computational model and system architecture selection to solve a problem
 - manage learning and development, including time management and organisational skills.
 - act autonomously in planning and implementing tasks at a professional level
 - discuss and present findings of research, analysis, and evaluation
 - develop an Information System/Information Technology project plan and explain the risks inherent in developed plans

Learning outcomes (PGDip Computer Science)

Students who are granted the PGDip will be expected to have passed eight 15-credit modules from a choice of ten (120 credits total). As such, students obtaining this qualification

should have gained sound understanding of the learning outcomes listed above for the MSc as relevant for the modules chosen.

Learning outcomes (PGCert Computer Science)

Students who are granted the PGCert will be expected to have passed four 15-credit modules (60 credits total) from a choice of ten. As such, students obtaining this qualification should have gained sound understanding of the learning outcomes listed above for the MSc as relevant for the modules chosen.

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities provided. More detailed information on the specific learning outcomes, content and the learning, teaching and assessment methods of each module can be found in the module syllabuses.

Learning, teaching and assessment strategies

The core principles of the Standard Academic Model, which incorporates the learning, teaching and assessment strategy for this programme, are outlined below.

Principle 1: Access and opportunity

Our programmes are designed to maximise access and opportunity for learners. An online induction will ensure that students are prepared for study and are familiar with the learning environment and sources of support during their student journey.

Principle 2: Student learning

Our programmes are designed to provide students a rich, vibrant, rigorous and engaging learning experience.

Principle 3: Student support

Our programmes are designed to provide students with the support they need to succeed and fulfil their potential.

Principle 4: Programme and module structure

Our programmes follow a consistent structure, designed to drive progression and retention, and offer flexibility within an efficient module release schedule.

Principle 5: Design for learning

Our programmes are a co-creation between various teams who each contribute their professional expertise, and educational design for successful learning is at the heart of the programme development process.

Principle 6: Unbundling, portability

Wherever possible, our modules are designed as discrete sequences of learning for maximum use and portability.

Principle 7: Assessment

Our assessment is rigorous, robust, secure, transparent and aligned to the learning outcomes.

Principle 8: Equality, Diversity and Inclusion

Inclusion is at the heart of our practice in teaching, learning and assessment.

Assessment methods

Each module is run over a 10-week block, with the exception of the Project which is run over two 10-week blocks.

The following modules are assessed by two assessments: one online test of a suitable type for the specific module, for example, multiple choice questions (MCQs) or auto-graded problem-solving task using programming (25%) and an end of term coursework assessment/online examination (75%):

- Applied Machine Learning
- Cloud Computing
- Object-Oriented Programming
- Principles of Programming
- Software Design and Programming

The following modules are assessed by an end of term coursework assessment/online examination (100%):

- Computer Systems
- Data Management
- Fundamentals of Computing
- Information Security
- Information Systems

The Project is assessed by two assessments: a Research Proposal (30%) and a Project Report (70%).

Where a module has more than one element of assessment, the grade awarded for each module will be based on both elements of assessment. Students will be required to pass the module with a weighted average of 50%.

Repeating a module may be done once the module results have been confirmed by the Board of Examiners.

Coursework is submitted in the VLE by prescribed deadlines.

Student support and guidance

Key features of the support for students include:

- [Student Portal](#): for accessing student induction, study skills support, careers and employability resources, student wellbeing advice.

- Student induction resources.
- [Student Guide](#): This provides information which is common to all students and gives guidance on a range of issues from the start of a student's relationship with the University of London through to their graduation.
- VLE containing: self-assessment and student planner tools; comprehensive learning materials; e-resources/e-library; student forums and progress monitoring tools
- Online student advisor and online tutor
- [Programme Regulations](#).
- [The Online Library](#): This provides a range of full-text, multidisciplinary databases where journal articles, book reviews and reports can be found.
- A University of London email account and web area for personal information management.

Quality evaluation and enhancement

The University of London delivers the majority of its flexible and distance learning programmes through a collaboration between the University of London Worldwide and member institutions of the University of London. However some of the flexible and distance learning programmes draw solely on academic input from the University of London, and are delivered without academic lead by a member institutions. The policies, partnerships (where applicable) and quality assurance mechanisms applicable for the programmes are defined in the following key documents: The Quality Framework, the [Quality Assurance Schedules](#), [Guidelines for Examinations](#), [General Regulations](#) and, for each programme, [programme specific regulations](#).

Awards standards

All University of London qualifications have to align with the [Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies](#) to assure appropriate standards for each qualification. In addition, every programme that is developed by a member institution of the University of London (or a consortium with representation by more than one member institution) will be developed to the same standard as would be applied within the institution concerned. Proportionate and robust approval procedures, including external scrutiny and student engagement are in place for all programmes. Learning materials are written and all assessments are set and marked by academic staff who are required to apply the University's academic standards.

Review and evaluation mechanisms

Some of the key mechanisms in place to assure the standards of all University of London qualifications and the quality of the student experience, include:

- Annual programme reports: produced for all programmes in order to review and enhance the provision and to plan ahead;
- Independent external examiners: submit reports every year to confirm that a programme has been assessed properly and meets the appropriate academic standards;
- Annual student information statistics: prepared for all systematic reporting within the University of London;

- Periodic programme reviews: carried out every 4-6 years to review how a programme has developed over time and to make sure that it remains current and up-to-date.

Improvements are made as necessary to ensure that systems remain effective and rigorous.

Student feedback and engagement

The principal channel for collecting feedback from students is the Student Experience Survey. Carried out every two years, this collects feedback from the student body on a range of topics relating to the student lifecycle. The results are analysed externally and then considered in a number of different ways, including by the programme team, principal committees and the senior leadership team. Details of any resulting actions taken are published on the Virtual Learning Environment and the Student Portal.

Additionally, on completion of their programme of study students will be invited to take a survey that seeks to measure what they have gained from their studies.

There are also opportunities for students to get involved in governance. An undergraduate and postgraduate student member is appointed by the University to the majority of committees through an annual appointment round. Some programmes also recruit student members at the programme level. Students are frequently invited to take part in quality review processes such as Periodic Programme Reviews, Programme approval, Thematic Reviews, MOOC review panels and ad hoc focus groups. Opportunities such as these are advertised through social media and on the website. More information can be found on the [website](#).

Students can also apply to join the Student Voice Group, which meets four times a year to consider initiatives for enhancing student experience. Notes from these meetings are published on the Student Portal.

After graduation

Further study

Successful completion of the programme may serve as preparation for students who wish to go on to take further study in the subject area. Enquiries about further study opportunities should be directed to the University of London Student Advice Centre 'ask a question' button in the [student portal](#).

Graduate employment routes

At registration, students are asked to complete a small number of questions relating to where they are in their career planning. This data is used to assist with the implementation of employability strategies and interventions.

This programme is targeted at career minded individuals who wish to develop their professional skills with master's level understanding and skills. Possible career paths include different software engineering roles ranging from testing and quality assurance to software architecture, devops and full-stack engineering. This degree can also be useful in becoming a systems analyst, engineering manager, or other role that requires an in-depth understanding of software design and practice in a range of sectors or organisations.

The Alumni Community

Upon finishing a course of study, graduates automatically become part of the University of London alumni community, a diverse global network of more than one million graduates in over 180 countries, providing lifelong links to the University and to each other.

Alumni are encouraged to keep in touch after they graduate and to become active members of the alumni community; in return they receive a number of benefits and services, including an extensive programme of events and engagement opportunities.

More information is available on the alumni [webpage](#).

Follow the alumni community on social media: [Facebook](#), [Instagram](#), [LinkedIn](#)