UNIVERSITY OF LONDON

Programme Specification 2018–2019

Computer Science

BSc

Important document – please read

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Important information regarding the Programme Specification

About this document

Last revised 26 February 2019

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 links to ask a question via the Virtual Learning Environment (VLE).

For the BSc Computer Science programmes, you should note the following terminology:

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.

Core module: Core modules are central to the teaching and learning of a programme and may introduce concepts and ideas that appear in the compulsory and optional modules. Core modules must be passed. There is one core module on the BSc Computer Science programme. Where specialist modules are offered they will also be deemed core.

Compulsory module: A module which must be taken as part of a degree programme.

Optional module: A Level 6 module chosen from a list.

Are you affected by US-imposed restrictions?

Our suite of BSc Computer Science degrees use creative interactive approaches delivered through Coursera, the world's largest online learning platform, to provide immersive learning experiences.

United States export control regulations prevent Coursera from offering services and content to users in certain countries or regions. More information about which countries or regions are affected can be found here. Coursera must enforce this restriction in order to remain in compliance with US law and, for that reason, we advise that all learners check this information before applying to the programme.

Key revisions made

Programme specifications are revised annually. The quality committee of Goldsmiths, University of London, 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.

Significant changes made to the programme specification 2018-2019:

This programme is being offered for the first time in April 2019.

Note: This programme specification was amended after initial publication to reflect changes to the computer requirements for this programme and to highlight US-imposed restrictions which could affect some students. See above for this latter information.

Some modules have specific hardware and software requirements. Refer to the Computer specification and internet access section of this document for further information.

Title and name of awards

Programme name

Computer Science

Award titles

- Bachelor of Science Honours degree in Computer Science

- Bachelor of Science in Computer Science (unclassified)

- Diploma of Higher Education in Computer Science (Exit Award Only)

- Certificate of Higher Education in Computer Science (Exit Award Only)

Intermediate awards

An intermediate award or awards (i.e. a Certificate of Higher Education and/or Diploma of Higher Education in Computer Science) may be granted to a student registered on the BSc as they progress through their degree studies.

Exit awards

Students who for academic or personal reasons are unable to complete the BSc may exit with the successful completion of 240 or 120 credits and be awarded a Diploma of Higher Education in Computer Science or a Certificate of Higher Education in Computer Science respectively.

Individual Modules

There is no provision for individual modules of the programme to be studied on a standalone basis.

Level of the programmes

The Framework for Higher Education Qualifications in England, Wales and Northern Ireland (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):

- Bachelor of Science (BSc) – Level 6

- Diploma of Higher Education (DipHE) – Level 5

- Certificate of Higher Education (CertHE) – Level 4

Relevant QAA subject benchmarks group

The subject benchmarks for Computing can be found here.

Awarding body

University of London

Registering body

University of London

Academic direction

Goldsmiths, University of London

Accreditation by professional or statutory body

Not applicable

Language of study and assessment

English

Mode of study

Web supported learning with an online tutor or institution supported learning from a local institution, where this is available. Institutions which support this programme will be listed on the Institutions Directory.

Programme structures

The programme will have **two** registration points in the year corresponding with start dates for modules.

The BSc programme is a 360 UK credit degree. For the award of a BSc in Computer Science a student must complete:

- one 15 credit **core** module and seven 15 credit **compulsory** modules at FHEQ Level 4 (120 credits), plus

- eight 15 credit **compulsory** modules at FHEQ Level 5 (120 credits), plus

- six 15 credit **optional** modules at FHEQ Level 6 and a 30 credit project (120 credits)

Maximum and minimum periods of registration

The BSc, via the Direct Entry Route, can be completed in a minimum of **three years**, subject to module availability. However, students may take up to **six years**.

Students entering via Performance Based Admissions will have a maximum of **three years** to complete the two modules required for admission to the full programme. The six year registration period will begin from the point at which they register on the full BSc.

This is a flexible programme which allows students to study at their own pace (either part-time or full-time), adjusting the intensity of the learning to suit their needs.

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.

For the BSc in Computer Science:

- modules are 15 UK credits each.

- the final project is worth 30 UK credits

A student awarded the BSc with honours will have accumulated 360 UK credits (180 ECTS credits).

Recognition and accreditation of prior learning (APL)

This programme allows for accreditation of prior learning. A student studying a degree through the Direct Entry Route may apply for recognition and accreditation of prior learning for up to **120 credits** at FHEQ Level 4.

To be eligible to apply for recognition of prior learning a student must provide evidence to the University that they have already passed examinations that both satisfy the required learning outcomes and equate in level, content and standard to the modules(s) that form part of the programme.

The qualification must have been awarded within the past five years preceding the application. If a student's prior learning is recognised they will not have to take the corresponding module as part of their degree.

Details on how to apply for recognition of prior learning can be found on our website. See the General Regulations (Section 3) and Programme Regulations (Section 2) for more rules relating to recognition and accreditation of prior learning.

Entrance requirements

There are two application points each year corresponding to the two study sessions. Applicants must submit an application in line with the procedures and deadlines set out on the website.

Entry route 1 – Direct entry route

To be eligible to register, applicants must:

- normally be aged 17 or above by the registration deadline of the session in which they will be entering

- satisfy the University of London General Entrance Requirements for an undergraduate programme

- have a qualification equivalent to a pass at UK GCE 'AS' level in a mathematical subject or a UK GCSE/GCE 'O' level in Mathematics at no less than grade B (equivalents can be found on our website).

- satisfy the University of London English Language Requirements

Entry route 2 – Performance based admission

If applicants do not meet the academic requirements for direct entry, they can apply for the programme via the performance based admission route.

To be eligible to register, applicants must:

- have passed at least four separate subjects at GCSE or GCE O level, with grades A to C, or the equivalent; and

- satisfy the University of London English Language Requirements

To be admitted onto the full BSc programme, applicants must:

- pass both Introduction to Programming I and either Numerical OR Discrete Mathematics with a weighted average of 40% or above;

Where students achieve a mark of 50% or higher in the coursework element for both modules, they will be admitted onto the full BSc programme and permitted to register for further modules in the next study session, subject to any relevant progression rules.

Where students achieve a mark below 49% in the coursework element for one or both modules, they may continue to the final assessment. If students achieve a pass in both modules overall, they will be admitted onto the full BSc programme and permitted to register for further modules in the next available session, subject to any relevant progression rules.

Students on the performance based admission route will have three attempts to pass each module. This route helps applicants to develop the necessary skills to complete the full BSc Computer Science programme successfully.

Full details of entrance requirements are also given on the programme page, under the Requirements tab.

English language requirements

All applicants must satisfy the English language requirements for the programmes. These are set out in detail on the programme page under the Requirements tab. Additional information on English language proficiency tests are given on the website. Where an applicant does not meet the prescribed English language proficiency requirements but believes that they can demonstrate the requisite proficiency for admission the University may, at its discretion, consider the application.

Computer specification and internet access

All students

All students must have regular access to a computer (or mobile device*) with an internet connection to use the University of London website and the VLE. These are where the programme's study resources are located.

The VLE provides electronic learning materials, networking opportunities, and other resources. Students will also have access to the University of London Online Library.

* Full mobile access is not available for all programmes.

Whether studying on their own or at a Teaching Centre, student should have the minimum computer configuration as follows:

- Processor: 2GHz

- Hard drive: 50GB free

- Minimum screen resolution: 1024 x 768 colour

- Networking: reliable network connection

- RAM: 4GB

- Audio output Soundcard: stereo

- Sound card and speakers (or headphones) are also recommended for playing audio materials

- Sufficient bandwidth to access video content

If using a PC, students will need Windows 7 or later software. If using a Mac, Mac OS 10.11 or above is recommended.

Students will also need the following applications installed:

- an up-to-date web browser, such as Chrome, Firefox, Safari or Edge. This must accept cookies and have JavaScript enabled. Refer here for the latest information.
- a word processor that accepts Microsoft Word formats (.doc and .docx);
- a PDF reader (e.g. Adobe).
- video and audio recording capability, for example web cam or other device;
- a microphone

Module specific requirements

Note: The published fees associated with this programme of study **do not** include the cost of any additional hardware or software purchased. Students are responsible for budgeting for this requirement.

Certain modules may have additional software requirements and students should have the necessary admin rights in order to be able to install new software on their computer. Any software required will always be freely available and compatible with Windows and Mac. Wherever possible, it will also be compatible with GNU/Linux. Further information will be provided via the VLE upon module registration.

Certain modules may also have additional hardware requirements as set out in the table below.

Module	Requirements
Numerical Mathematics	- A scientific calculator or equivalent
Mobile Development	- Access to an Android or Apple smart phone that can be connected to a computer using a USB cable

Games Development	• Students will need a computer that matches the specifications for Unity 3D (https://unity3d.com).
3D Graphics and Animation	• Students will need a computer that matches the specifications for Unity 3D (https://unity3d.com).
Virtual Reality	• Students will need a computer that matches the specifications for Unity 3D (https://unity3d.com). • VR Head Mounted Display with the ability to be used in developer mode.
Physical Computing and Internet of Things	• An Arduino Starter Kit or similar: https://store.arduino.cc/genuino-starter-kit Optional: • A small kit to make electronics at home (tweezers, cutters, cutting mat, protective glasses) • A multimeter

Note

Students should ensure they have access to the listed hardware (i.e. an Arduino kit or similar) and have the ability to install the listed software on their computer before registering for these modules.

In the institution-supported model the institution will help to install all necessary software on lab machines where appropriate.

With specific reference to the Arduino kit (or similar), we suggest that the following website should be used as a starting point, though the components may be sourced individually: https://store.arduino.cc/distributors. Students should use the components with due care and attention as well as in accordance with any instructions provided in the kit. The University of London cannot accept any responsibility for loss or injury sustained in their use.

Students with specific access requirements

The University of London welcomes applications from disabled students and/or those who have specific access requirements. The University will make every effort to provide reasonable adjustments to enable those with a disability, learning difficulty or specific 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. The Admissions team encourages those students with a disability, or others who may need special arrangements to assist in taking examinations (such as separate room or special aids), to complete the relevant section of the application form, or contact the Inclusive Practice Manager. 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 the 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 programme web pages.

For further information see the website.

Educational aims and learning outcomes

Programme aims

The BSc Computer Science degree is designed to be an innovative online programme and provides students with support through virtual and local learning environments, and the flexibility to study at any time and from anywhere around the globe.

Learning outcomes

Students who successfully complete the **Certificate of Higher Education in Computer Science** will be able to:

- Demonstrate knowledge of the main areas of computer science and the ability to apply this within the context of computing applications
- Select and apply essential concepts, principles and practices of computer science in the context of well defined, limited scenarios, using structured arguments to justify the selection and use of tools and techniques
- Develop a simple system to a specification, with documentation
- Show problem solving and evaluation skills, drawing upon supporting evidence
- Demonstrate the ability to produce organised work given appropriate guidance.

Students who successfully complete the **Diploma of Higher Education in Computer Science** will be able to:

- Demonstrate knowledge and critical understanding of the main areas of computer science and also demonstrate the ability to apply this to the evaluation of computing applications
- Apply a critical understanding of essential concepts, principles and practices of computer science in the context of well-defined scenarios, using structured arguments based on subject knowledge to justify the selection and use of tools and techniques
- Analyse, design and develop a system, with appropriate documentation
- Show problem solving and evaluation skills, draw upon supporting evidence and demonstrate a general understanding of the need for a high quality solution
- Demonstrate the ability to produce organised work (both as an individual and as part of a team) given appropriate guidance

Students who successfully complete the **BSc in Computer Science** will, in addition to the learning objectives of the Diploma of Higher Education and Certificate of Higher Education, be able to:

- Demonstrate a sound understanding of all the main areas of computer science and also demonstrate the ability to exercise critical judgement in the evaluation of computing applications.
- Apply a critical understanding of essential concepts, principles and practices of computer science, and critically evaluate the results, in the context of loosely defined scenarios, using structured arguments based on subject knowledge to justify the selection and use of tools and techniques.
- Produce work involving problem identification and the analysis, design or the development of a system, with appropriate documentation, recognising the important relationships between these.
- Show problem solving and critical evaluation skills, draw upon supporting evidence and demonstrate a deep understanding of the need for a high quality solution.
- Demonstrate the ability to produce organised work with minimum guidance.
- Demonstrate the ability to produce a substantial piece of work from problem inception to implementation and documentation.

Learning, teaching and assessment strategies

The core principles of the learning, teaching and assessment strategy for this programme are outlined below.

Principle 1: Ensuring students are prepared for study

Students will be provided with opportunities to sample the learning content of the Computer Science programmes. An online induction will ensure that they are prepared for study and are familiar with the learning environment and sources of support during their student journey.

Principle 2: An engaging and vibrant learning environment

All students will have access to the VLE, with learning support and tools enabling them to monitor their progress, assessing fulfilment of learning outcomes and development of skills-based outcomes throughout the curriculum. The learning environment will provide a framework for the level of support selected by students, which involves local and online tuition services.

Principle 3: Learning content

The learning content will be designed to provide students with opportunities to engage, and encourage reflective and deep learning, with accessibility a key feature to enable all students to study across a range of mobile and media channels.

Principle 4: Student support

All students will have access to the Virtual learning environment, learning content, tools and activities related to their chosen programme of study. Students will be able to select from two modes of study: web supported learning or institution supported learning.

Principle 5: Flexibility

To facilitate the requirements of a diverse global community of learners, a core feature of this programme is flexibility in the design of the curriculum at Level 6, where students can specialise in a particular area of Computer Science. Students progress at a pace suitable to their circumstances.

Principle 6: Assessment

A core feature of this programme will be a varied range of learning activities embedded within the learning content for each module, designed to provide feedback to students on their progress towards learning outcomes. Summative assessment methods will be designed to promote retention of knowledge, providing encouragement through tutor feedback, with as wide a range of methods as possible to most effectively assess learning outcomes, within the context of the need for secure and reliable techniques appropriate to flexible learning.

Principle 7: Staff Development

The design, development and delivery of this programme will be supported with training for:

- Academic teams involved in the development of the materials and assessment;
- Module Leaders;
- Tutors and Administrators at teaching institutions.

Assessment methods

Each core and optional module, excluding the final project, has two elements of summative assessment. These will be EITHER a combination of coursework and a written examination, weighted in the ratio 50:50 OR two coursework elements weighted 50:50 or 30:70.

The coursework element(s) may consist of multiple items, online quizzes, one or more writing assignments and/or one or more programming assignments. The written examination is unseen and is two hours in length.

The final project is summatively assessed by a series of coursework submissions and an unseen, final examination lasting two hours. Coursework accounts for 80% of the final mark and the examination for 20% of the final mark. The coursework submission constitutes multiple, staged deliverables including, but not limited to: a project proposal, a preliminary report, weekly progress logs, a final report and a presentation. The project assessment and the feedback received by the student, is designed to encourage consistent, well-structured activity and progress throughout the project. The exam component consists of general questions about academic best practice, as well as specific questions about the candidate's own project work.

The grade awarded for each module is based on all the elements of assessment and is subject to the rules for marginal compensation. In order to pass a module a student must achieve at least 35% in each element of assessment and an overall weighted average of 40% for the module.

If students fail a compulsory or optional module with a mark of between 35% and 39%, they may be compensated, and have credit awarded in the same way as for passed modules providing the mean average mark for the Level is 45% or above. Compensation may be

applied by the Board of Examiners at the point of classification only. A maximum of 30 credits may be compensated at any given Level.

Written examinations take place in September and March.

Examinations are held at Examination centres throughout the world.

Coursework must be submitted to the VLE by the prescribed deadlines.

Student support and guidance

Key features of the support for students include:

- Student induction resources;
- The VLE containing: self-assessment and student planner tools; comprehensive learning materials; e-resources/e-library; student forums and progress monitoring tools;
- Local institution tutor (for institution supported learners);
- Online student relationship manager and online tutor (for web supported learners).

Quality evaluation and enhancement

The University of London collaborates with the member institutions to deliver the University of London programmes. The policies, partnerships and systems are defined within the key documents: The Quality Framework, the Quality Assurance Schedules, Guidelines for Examinations, General Regulations and, for each programme, programme specific regulations.

Parity of award standards

Every programme of study is developed by a member institution of the University of London (or a consortium with representation by more than one member institution) to the same standards as would be applied in the institution concerned. Proportionate and robust approval procedures, including external scrutiny and student engagement, are in place.

Learning materials are written and examinations are set and marked by academic staff who apply the University's academic standards.

Review and evaluation mechanisms

Procedures are in place to assure the standards of the award and the quality of the student experience, which include programme development, delivery, management, systematic monitoring and ongoing review and enhancement of all University of London. Improvements are made as necessary to ensure that systems remain effective and rigorous.

- Annual programme reports are produced for all programmes in order to review and enhance the provision and to plan ahead;
- Every year independent External Examiners submit reports to confirm that a programme has been assessed properly and meets the appropriate academic standards;
- Annual student information statistics are produced and are referenced in all systematic reporting within the University of London;
- Periodic programme reviews are 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.

Student feedback mechanisms

The Student Experience Survey, carried out every two years, collects feedback from the student body on a range of topics relating to the student lifecycle. The results are considered in a number of different ways, including by the Pro-Vice Chancellor, the Programme team, principal committees and departments at the University of London responsible for the different aspects of the student experience. Once the findings have been considered in detail, responses are published from both the University of London and from the individual Programme Directors.

Additional survey activity may also be conducted from time to time through the student portal, by email or from the programme team.

VLEs also provide the opportunity for informal feedback and discussion.

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 at https://london.ac.uk/current-students/getting-involved

After graduation

Further study

Successful completion of a BSc 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 using this link.

Graduate employment routes

The BSc Computer Science will allow you to develop a widely applicable skill set in computing with strong programming and mathematics skills, as well as softer skills in project management, presentation skills and teamwork. You will also have a portfolio of work that you can present to potential employers. Depending on the electives you choose in the final stage of the degree, you can orient your learning towards particular areas of interest such as machine learning, web development, data science and video games.

With the BSc Computer Science, you will be able to apply for a range of computational and mathematical jobs in the creative industries, business, finance, education, medicine engineering and science. Typical job titles include application programmer, software engineer, creative coder, video game developer and systems analyst.

The Alumni Network

Upon graduation, University of London students automatically become members of its Alumni Network, a diverse community of over 100,000 alumni in more than 180 countries. The Alumni Network can provide past students with lifelong links to the University of London and each other. Benefits include social and networking events, access to local groups, a bi-annual magazine, social networking groups, and the opportunity to become an Alumni Ambassador for the University of London.

For further information, please see https://london.ac.uk/alumni, www.facebook.com/londonualumni, www.instagram.com/_londonu and https://www.linkedin.com/school/university-of-london/