UNIVERSITY OF LONDON

BSc Computer Science

2019—2020

Your future is at your fingertips

Academic direction by

Goldsmiths
UNIVERSITY OF LONDON

Find your future at london.ac.uk/computer-science

Contents

A University of London degree from anywhere in the world

1 Career opportunities

Enhance your computing, analytical and problem-solving skills, using and developing emerging technology – focusing on your future.

2 Quality

Gain a world-class University of London degree. Choose from a suite of pioneering BSc Computer Science qualifications, which have been created by Goldsmiths, University of London, one of the UK's most innovative universities in the Computer Science field and a top 20 UK computing research institution.

3 Learn anywhere

We offer you the flexibility to fit your studies around your working life. If you need to travel, you can take your studies with you.

4 Tutor support

All students receive tutor guidance and feedback while studying for one of the BSc Computer Science degrees. If you register at one of our recognised teaching centres you'll receive face-to-face classes and additional support; if you're an online learner, you'll join a virtual tutor group.

5 A mark of excellence

The University of London's distinguished history of distance learning dates back to 1858. You'll gain a prestigious qualification that is recognised worldwide.

6 Join the World Class

When you graduate, you become part of our global network of influential alumni, which includes leaders in industry and Nobel Prize winners.

Your future is at your fingertips

The BSc Computer Science from the University of London gives you the skills to achieve your career goals. Our degrees use creative interactive approaches to provide immersive learning experiences that will help you build the technical and transferable skills you need for a fulfilling career.

This distance learning degree is defined by emerging technology – it isn't bound by lecture theatres or computer labs. You will study interactively through the Coursera online learning platform, joining a global network of students. However, you will not be expected to learn on your own. You'll be part of a learning group supported by professional computing tutors, either at a recognised teaching centre or online.

You will learn from experts in computing, their knowledge is drawn from real-life experience across a wide range of regions and industries.

A trusted name in global education

Founded in 1836, the University of London is one of the oldest and most prestigious universities in the UK. In 1858, we made our degrees available to study anywhere in the world. We now have more than 50,000 students in 180 countries.

Among our former students are seven Nobel Prize winners, including Nelson Mandela and Charles Kao, a pioneer in the development of fibre optics.

London as an academic base

London is home to some of the world's most innovative and entrepreneurial companies, over a third of all European billion-dollar start-ups are based in the UK. Many creative tech giants, including Facebook and Google, have offices in London.

This suite of BSc Computer Science degrees draws upon the city's creative and technological pedigree. You will be equipped with skills that are at the cutting edge of the industry, wherever you are in the world.

In your final year, you have the opportunity to transfer and study on campus at Goldsmiths, University of London.

More than
50,000
students in
180
countries
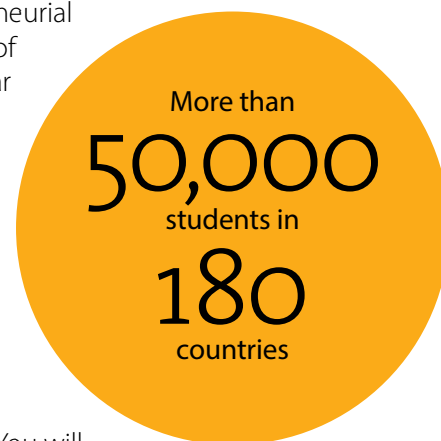
"Goldsmiths computing is about creativity. We are inspired by the fantastic art and music that surrounds us and we try to infuse this into our computing practice. Students of this course will not only be able to program and work logically to create solutions to problems – they will be able to try out their own ideas and express themselves creatively."

Dr Sarah Wiseman
Co-author of the Web Development module

Goldsmiths, University of London

The academic content for the BSc Computer Science degrees has been developed by the Department of Computing at Goldsmiths, one of the UK's top creative universities.

Founded in 1891, Goldsmiths is world-renowned for teaching and research in creative, cultural and computational disciplines. Goldsmiths encourages students to explore ideas, challenge boundaries, investigate fresh ways of thinking, and stretch themselves intellectually and creatively. The Department of Computing at Goldsmiths is driven by a view of Computer Science that captures this spirit.

Goldsmiths believes that studying Computer Science is learning by doing and experimenting. The department uses a hands-on, project-based style of teaching for a range of topics from computer and data science all the way through to art, music, social science and journalism.
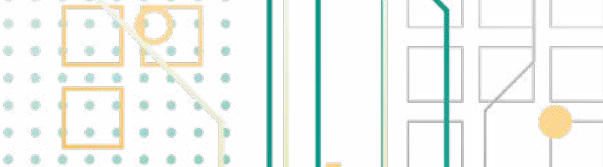
This ethos has created highly interactive degrees which make use of the latest technology and education. You will learn from experts in computing, whose experience spans many regions and industries.

Besides Computer Science, Goldsmith's Department of Computing research and teaching also covers an array of topics including computational art, virtual reality, computer music, digital sociology and education technology.

Founded in
1891

"We are excited to be offering an entirely new Computer Science degree that is specifically designed to address the challenges of the present and future workplace. Our approach is to encourage creative thinking and novel applications in the hot areas of computing such as machine learning and artificial intelligence, games and virtual reality and data science."

Dr Matthew Yee-King
Programme Director,
BSc Computer Science degrees

Collaboration with Coursera

We are extremely proud to be the first university chosen by Coursera as it embarks on a collaboration to offer a suite of undergraduate degrees through online distance learning

The University of London has more than 40 Massive Open Online Courses (MOOCs) on the Coursera platform, generating over 1.3 million Coursera learner enrolments.

Coursera has 31 million registered learners spread over 2,600 courses and 236 specialisations. They've partnered up with some of the world's top universities, which include NYU, Princeton, Stanford, Duke, National Taiwan University and Shangai Jiao Tong.
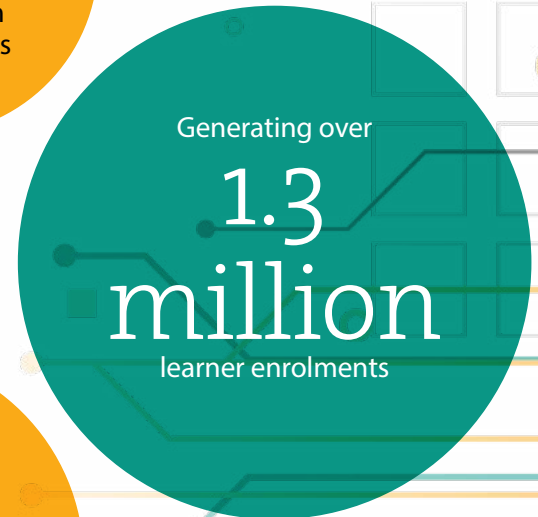
Coursera's courses are used by leading brands like Tata, InfoSys, L'Oreal to train and update their staff.

You can read more about Coursera at: about.coursera.org

Are you affected by US-imposed restrictions?

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 at: bit.ly/intl-restrictions

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.

Over
40
Massive Open
Online Courses

Generating over
**1.3
million**
learner enrolments

**31
million**
registered learners

"Welcome to Coursera's first Bachelor's degree, a unique collaboration between the University of London, the world's oldest provider of distance learning, Goldsmiths, University of London and Coursera, the world's largest online learning platform.

In 2011, an experiment at Stanford University took three courses and made them available online, enabling anyone, anywhere to learn this unique content. When hundreds of thousands of learners signed up, it demonstrated the critical need for people to have access to a truly high-quality education.

As it happens, all three of these courses were in computer science; this is not surprising, since the demand for qualified computer science professionals is enormous. A computer science education opens multiple opportunities for its graduates, across many diverse areas. Like Coursera's earliest courses, we would like anyone, anywhere to have access to these opportunities.

This new degree, an online Computer Science Bachelor's degree offered by Goldsmiths and the University of London is designed to equip students with in-demand computing skills and abilities to solve complex problems, all while nurturing their innovation and creativity. This degree will transform lives around the world. Please join us in taking this journey."

Daphne Koller
Co-founder, Coursera

Online and flexible learning explained

You can choose to start the degree in either April or October

The BSc Computer Science degrees can be completed in three to six years. Each module is studied over 22 weeks and requires an average of five to six study hours per week. Modules run up to twice each year (subject to demand). You can study up to four new modules at a time (or two plus your Final Project).

1 Decide when you want to enrol, either in April or October.

2 Then choose whether you want to enrol:

- as a web-supported learner – this means you'll join an online group, where your tutor will provide support via discussion groups

  or

- with a recognised teaching centre (where available). You'll be able to attend face-to-face classes and interact with other students on your course.

Guaranteed tutor support
All students receive tutor support and feedback while studying for one of our BSc Computer Science degrees. Tutors introduce the modules, respond to queries and provide guidance on the assessments. If you register for support at one of our recognised teaching centres you'll receive face-to-face classes and tutor support.

If you register as a web-supported learner, your tutor will provide support through the Coursera platform, where you'll have access to peer discussion forums and learning activities.

For details about recognised centres please visit: london.ac.uk/teaching-institutions

Assessment
The degree is assessed through coursework, portfolios and written examinations. Your final grade for each module is based on a mixture of these assessments (e.g. 50% coursework, 50% examination).

While you're studying each module, you'll receive feedback from the University of London about your assessments and achievements so you can see how you're progressing. You'll also be given a record of your successes to keep you on track. You can sit your examinations at any of our approved centres worldwide. For more details, see: london.ac.uk/exams

Celebrate your graduation
After completing your degree, you'll get a University of London diploma and an invitation to the annual graduation ceremony in London. The event is usually headed by the University of London's Vice-Chancellor or its Chancellor, HRH the Princess Royal.

Take your career to the next level

We know it's important to consider your future career before you embark on a degree. The BSc Computer Science degree allows you to focus on industry specialisms that help you to achieve your career goal

BSc Computer Science

The BSc Computer Science will allow you to develop a wide and practical skillset in computing with strong programming and mathematics skills, as well as softer skills in project management, presentation and teamwork. You will also have a portfolio of work that you can present to potential employers. Depending on the specialisms you choose in the final stage of the degree, you can direct 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 qualified 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.

BSc Computer Science (Data Science)

Data science is a significant subfield in computer science which has seen rapid growth in recent years as companies and institutions have begun to gather data at scale across many sectors. Data science has many applications ranging from medicine to climate science and business analytics.

With the BSc Computer Science (Data Science), you'll be able to apply for a range of data-intensive technical jobs in sectors such as business, finance, medicine, education, engineering and science as well as in the creative industries. Typical job titles include data scientist, data visualisation engineer, business data analyst, data manager and data engineer.

BSc Computer Science (Machine Learning and Artificial Intelligence)

Machine learning (ML) provides a means for computer systems to extract useful information from data. These techniques are widely used in the technology industry for a variety of applications, for example, recommending music and products to people, identifying faces in photos and predicting trends in financial markets.

With the BSc Computer Science (Machine Learning and Artificial Intelligence), you will be able to apply for a range of technical, problem-solving jobs in a rapidly growing area. Companies and institutions are applying ML and AI (artificial intelligence) to a wide range of problems in business, finance, medicine, education, video games, engineering and science as well as new application areas such as music and other creative work. A typical job title is machine learning engineer.

BSc Computer Science (User Experience)

User experience design or UX has grown out of the field of Human-Computer Interaction (HCI), which is about how to design computer systems for use by people. HCI is a major subfield of computer science, and it informs the visual design and workflow of computer systems we use every day. HCI draws on a range of hard and soft skills and is a naturally cross-disciplinary subject.

With the BSc Computer Science (User Experience), you'll be able to apply for jobs which involve a flair for design and engagement with end users in a range of sectors, wherever there is a need for effective user interface design. Typical job titles include UX engineer, UX designer and user interface designer.

BSc Computer Science (Web and Mobile Development)

Web and mobile development are critical application areas for computer science. Many of the largest technology companies maintain large scale web applications, providing services such as social media, search, advertising and video and audio streaming. Mobile application development has become a major part of the software industry over the last decade, with established, as well as new, companies developing thousands of mobile games and utilities.

With the BSc Computer Science (Web and Mobile Development), you will be qualified for jobs involving the development of web and mobile technology such as websites and applications for smartphones and tablets. Typical job titles include mobile application developer, mobile software engineer, front-end engineer, full stack developer and back-end developer.

BSc Computer Science (Physical Computing and the Internet of Things)

Physical computing involves the creation of hardware devices that can sense and act in the real world. Physical computing techniques underpin a wide range of contemporary technology trends such as the Internet of Things, the quantified self and smart homes. There are many applications for physical computing, for example in creative arts, museums, ubiquitous and embedded computing, scientific sensing, robotics and engineering control systems.

With the BSc Computer Science (Physical Computing and the Internet of Things), you'll be able to apply for jobs in a rapidly growing and exciting area which is finding applications across different sectors. Typical job titles include Internet of Things engineer, creative technologist and embedded software engineer.

BSc Computer Science (Games Development)

Video games are a critical application area for computer science, and the games industry forms a significant part of the creative economy. It is a complicated subject, drawing on other areas such as computer graphics, interaction design and artificial intelligence.

With the BSc Computer Science (Games Development), you will be able to apply for a range of jobs in the creative industries, especially in the video games industry. Typical job titles include game designer, video game tester and video game programmer.

BSc Computer Science (Virtual Reality)

Virtual reality (VR) involves the creation of immersive, simulated environments using computer systems. Recent technology advances have made it possible to create high fidelity, high immersion virtual realities which people can access with consumer hardware. VR has many application areas, including entertainment, education and military.

With the BSc Computer Science (Virtual Reality), you'll be qualified for exciting jobs in an emerging area which spans sectors such as the creative industries, video games and education and training. Typical job titles are VR developer, environment artist, VR architect and augmented reality engineer.

"From game-based learning environments which teach code fundamentals to street magic demos which illustrate maths concepts — in creating this degree we've brought together the most innovative aspects of our teaching at Goldsmiths. We've distilled our many years of experience in computing pedagogy into this new and exciting online format."

Dr Simon Katan
Co-author of the Introduction to Programming I and II modules

Degree structure

Level 4
Eight Compulsory Modules

Introduction to Programming I*
Introduction to Programming II
Numerical Mathematics
Discrete Mathematics
Fundamentals of Computer Science
How Computers Work
Algorithms and Data Structures I
Web Development

Level 5
Eight Compulsory Modules

Object-Oriented Programming
Software Design and Development
Programming with Data
Agile Software Projects
Computer Security
Graphics Programming
Algorithms and Data Structures II
Databases, Networks and the Web

Level

6
Six Modules + The Final Project

BSc Computer Science (Data Science)	BSc Computer Science (Machine Learning and Artificial Intelligence)	BSc Computer Science (User Experience)	BSc Computer Science (Web and Mobile Development)
Data Science*	Databases and Advanced Data Techniques*	Virtual Reality*	Databases and Advanced Data Techniques*
Databases and Advanced Data Techniques*	Machine Learning and Neural Networks*	Advanced Web Development*	Advanced Web Development*
Machine Learning and Neural Networks*	Artificial Intelligence*	Physical Computing and the Internet of Things*	3D Graphics and Animation*
Advanced Web Development*	Intelligent Signal Processing*	Mobile Development*	Mobile Development*
Natural Language Processing*	Natural Language Processing*	Interaction Design*	Interaction Design*
One elective from any other specialism	One elective from any other specialism	One elective from any other specialism	One elective from any other specialism
The Final Project	The Final Project	The Final Project	The Final Project

BSc Computer Science (Physical Computing and the Internet of Things)	BSc Computer Science (Games Development)	BSc Computer Science (Virtual Reality)	BSc Computer Science
Databases and Advanced Data Techniques*	Artificial Intelligence*	Virtual Reality*	Six Elective Modules from any of the specialisms
Advanced Web Development*	Virtual Reality*	Games Development*	The Final Project
Physical Computing and the Internet of Things*	Games Development*	3D Graphics and Animation*	
Interaction Design*	3D Graphics and Animation*	Mobile Development*	
Intelligent Signal Processing*	Interaction Design*	Interaction Design*	
One elective from any other specialism	One elective from any other specialism	One elective from any other specialism	
The Final Project	The Final Project	The Final Project	

*Core Modules

Level 4 modules

Algorithms and Data Structures I

This module will help you to develop your analytical and problem-solving skills. It will encourage you to think about how to use computers to solve problems. You'll develop skills in thinking algorithmically and learn the central concepts of algorithms and data structures. You will learn about linear data structures such as arrays, vectors and lists and a unifying framework for considering such data structures as collections. You'll study how algorithms can be expressed as flowcharts and pseudocode and how to convert these into programs. You'll learn specific algorithms used for sorting and searching, and how to express repetition as iteration and recursion. You will learn a simple model for execution of computation, and how to describe computational problems and their solutions. The model will allow you to compare algorithms regarding their correctness and regarding their efficiency.

Discrete Mathematics

This module helps hone your skills in thinking abstractly. It also introduces you to many of the discrete models used to help understand and design computational systems. Through this module, you'll develop the fundamental discrete mathematical tools that will support you during the BSc degree. Particular attention is paid to notions of experimentation, reasoning and generalisation.

Fundamentals of Computer Science

In this module, you'll gain a broad understanding of key topic areas in computer science and the fundamental concepts underpinning them. In the area of fundamental concepts, you'll learn about binary representations and logic, complexity theory and theories of computation, finite state machines and Turing machines. Building on this, you'll then study key areas of interest in computer science including databases, artificial intelligence and machine learning. These will be presented as practical examples to illustrate how they are implemented in modern computer systems.

How Computers Work

How Computers Work helps you understand and interact with computer systems. The module will teach you how to use knowledge about computational processes to analyse and explain the behaviour of computer systems. It will use the concept of a Notional Machine, an abstract representation of the functioning of a computer system, to help you to reason about computer systems and predict their behaviour. You'll also learn about typical computer system architectures, basic networking and network services such as databases.

Introduction to Programming I

This module focuses on basic programming techniques. You'll learn how to use the fundamental elements of computer programming such as variables, conditionals, functions and loops. You'll learn how to create interactive, graphical computer programs. You will also be introduced to basic object-oriented programming techniques.

Introduction to Programming II

By taking this module, you will enhance your programming skills through the development of a project. You will learn about producing maintainable code, defensive coding techniques, program testing techniques, cyclical approaches to software development, encapsulation, developing code across multiple files and using third-party libraries.

Numerical Mathematics

This module helps hone your skills in thinking abstractly. It also introduces you to many of the standard continuous models used to help understand and design computational systems. You will develop the fundamental numerical mathematical tools that will support you during the BSc degree. Particular attention is paid to notions of experimentation, reasoning and generalisation. You'll learn many of the numerical mathematical concepts and techniques that underpin Computer Science. In particular, you'll study number systems, special functions, graphing and linear algebra.

Web Development

This module provides you with a foundational web development skillset. You will learn the critical languages of the web: HTML, CSS and JavaScript. Using HTML and CSS, you'll learn how to mark-up, layout and style web content. You'll study the document object model and how you can dynamically manipulate it with JavaScript to create interactive web pages. You'll consider accessibility and usability issues, and how you can overcome them. You'll learn about website deployment and how to make your websites accessible to other people. The module also enables you to present your work online in the form of a website.

Level 5 modules

Agile Software Projects

The Agile Software Projects module provides insights and practice in software development using contemporary methods to produce software that meets the needs of users and supports business functions. The module enables you to gain competence in the conceptualisation of a technology-based solution to a real-world problem, fulfilling the requirements of users while considering constraints imposed by market conditions and lessons learned from prototypes. You will then present a proposal for a technical project including a plan for implementing the solution using the agile development methodology and test-driven development practices. From concept to solution presentation, you'll be required to work in a distributed team using online collaboration, project tracking and version control tools.

Algorithms and Data Structures II

This module provides you with detailed knowledge of common algorithms and data structures. You'll improve your understanding of searching and sorting and learn new algorithms to solve new problems. You'll learn about a range of data structures such as trees, heaps, sets, maps, stacks, queues and graphs. You'll also learn how to evaluate and describe the performance of algorithms using big-O notation.

Computer Security

The Computer Security module gives you an understanding of the need for computer security and the technologies supporting it. It has both a theoretical component that will teach you mathematical underpinnings of security systems and a practical element to help you discover the pitfalls of security design and comprehend the mathematics underlying the protocols by small programming examples.

Databases, Networks and the Web

In this module, you'll learn theory and practical skills focused on the modern web, internet and client-server applications. You'll learn about relational database systems, emphasising issues related to data modelling and Structured Query Language (SQL) database implementation. You'll learn how to model data in a database, retrieve data from the database and provide access to data through dynamic websites. You'll learn about the Relational Model, Query processing, and socket architectures to enable communication.

Graphics Programming

Here you will learn how to work with images in a variety of ways. You'll learn how to synthesise graphics and how to process visual signals. You will learn about the mathematical ideas that underpin digital representations of graphics; how digital media files represent graphics, and how to handle and manipulate them, and the basics of working with simulated physics and 3D graphics.

Object-Oriented Programming

This module will provide you with an object-oriented programming skillset. You'll learn what objects and classes are and how to write classes. You'll see how objects can interact with each other, including defining and implementing interfaces to control the interaction. You'll learn how to use inheritance to extend functionality from parent classes. You'll learn how to write code according to style guidelines and how to write formal code documentation.

Programming with Data

This module demonstrates how to work with data: getting data from a variety of sources, visualising data in compelling, informative ways, processing data to make it useful and shareable, and reasoning with data to test hypotheses and make predictions. The module also introduces you to a new programming environment that is well-adapted to languages for these applications.

Software Design and Development

Software Design and Development advances your software development skills so you can write more robust and complicated programs. You'll learn how to use a range of programming techniques to deal with unwanted or unexpected events that might happen when your application is running. You'll use defensive coding to check data before processing it, and exception handling to gracefully manage unforeseen occurrences. You'll discuss program structure concerning cohesion (how to meaningfully organise code into modules) and coupling (how to define the interactions between different parts of the program). You'll learn about test-driven development, where you write tests for your code, and write the code itself, in parallel. You'll also learn how to use versioning tools to manage the development of a software project.
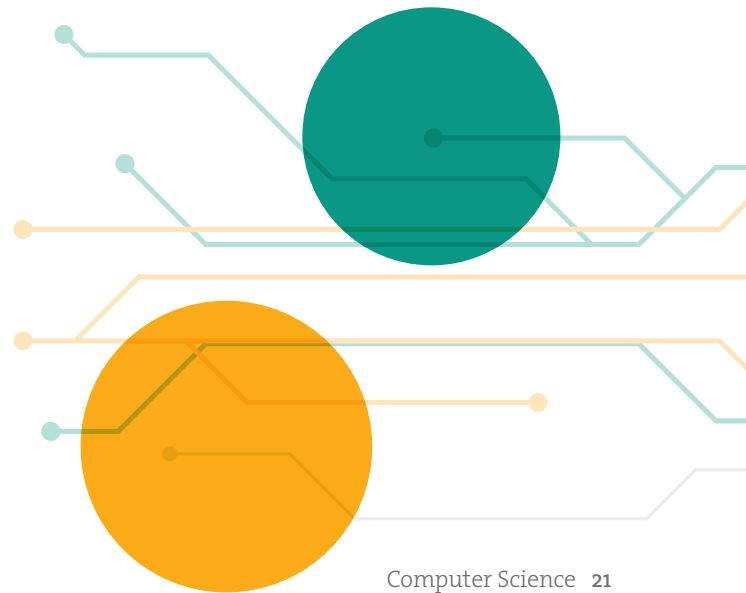
Level 6 modules

3D Graphics and Animation

This module covers advanced methods used in current state-of-the-art graphics and animation systems. It includes mathematical foundations, computational techniques and their use in creative practice. In this module, you'll learn how to write programs that generate animated 3D graphics. There are several distinct study areas: 3D modelling and animation, the graphics pipeline, simulation of physics and shader programming. You'll study a range of examples and learn how to program graphics in contemporary graphical software for different applications.

Advanced Web Development

Advanced Web Development teaches you how to build dynamic, data-driven websites using databases, front-end frameworks and server-side programming. You'll develop the skills needed for full stack web development work and develop a web developer skillset, enabling you to build and deploy complete, data-driven websites. You'll consider different technologies for client-side web development such as HTML, CSS, JavaScript and templates. You'll explore methods for developing server-side web applications, by building web-accessible wrappers around databases, consider scalability issues and learn about web app configuration and deployment.

Artificial Intelligence

Focusing on Artificial Intelligence (AI) techniques, you will learn the historical development of AI including search, vision and planning. You will become familiar with the foundations of agent-based approaches to software design, decision making and problem solving including under uncertainty. You will have an opportunity to apply AI techniques to particular problems such as game playing and decision making.

Databases and Advanced Data Techniques

This module aims to show you how to work with data in your computer programs. You will learn how to use SQL and NoSQL databases to store tabular data and documents. You will learn about the ethics of gathering and processing data and why it is important to consider issues around data security. You will learn about open data resources, and how you can access them from your computer programs. You will learn about audio and video data, and the challenges of working with this kind of data.

Data science

This module will develop your data science skillset so that you'll be able to write programs that can read, process and analyse textual and numerical data. You will be able to generate plots and interactive visualisations of data and understand how to apply statistical methods to the interpretation

of results. You'll be able to use data analysis in the decision-making process. You'll also learn about application domains for data science.

Games Development

This module introduces you to i) industry standard tools for game development, such as game engines, and ii) the process of game development, including prototyping and playtesting. You will undertake a series of game development projects, each lasting a few weeks and with a specific brief. For each project, you'll propose a game that fits the brief then deliver the game and document it thoroughly. Through this process, you'll develop an awareness of intended audience and the use of media for documentation. Contemporary video game production draws on a range of techniques from AI to perform tasks like controlling virtual agents and generating novel content. This module also introduces crucial game AI concepts. Compared to mainstream AI, the emphasis is less on optimal problem-solving and more on entertaining the player with limited computational resources. This module provides practical experience of programming game AI systems and an understanding of the relevant theory.

Intelligent Signal Processing

Studying Intelligent Signal Processing will provide a broad experience of digital signal processing techniques and applications. You will study how programs can capture and process audio and video signals. You'll learn about time domain and frequency domain representations and processing and how you can extract information from audio signals. You'll implement movement and face detection systems that work with live camera input.

Interaction Design

In this module, you'll examine the notion of 'interaction with technology'. You will focus on the concepts behind modern UX design and production and gain a solid grasp and practical experience of the process which allows the creation of interactive systems. This process involves specification, design, prototyping and evaluation. You'll examine several design approaches and techniques and consider how they enable usability engineering. You'll learn how to evaluate interactive systems against criteria such as efficiency and usability. You'll examine accessibility issues from the perspective of different populations.

Machine Learning and Neural Networks

This module provides a broad view of machine learning and neural networks. You'll learn how to solve common machine learning problems such as regression, classification, clustering, matrix completion and pattern recognition. You'll explore how neural networks can be trained and optimised. You'll learn how to develop machine learning systems rapidly, and you will learn how to verify and evaluate the results.

Mobile Development

The Mobile Development module aims to give you the fundamental understanding and skills needed to develop mobile applications. By studying this module, you will learn the principles of effective mobile user interface design and how to design and build user interfaces. You'll learn about data-driven mobile apps, and how you can integrate an app with a data source. You'll learn about the

mobile development ecosystem and how to develop, run and test your applications. You'll work with various sensors available on mobile devices using built-in application programming interfaces. The style of the module is practical, focusing on developing working apps.

Natural Language Processing

Natural Language Processing (NLP) provides a grounding in both rule-based and statistical approaches to NLP, combining theoretical study with hands-on work employing widely used software packages. The module focuses on text processing and you'll learn about how to work with text-based natural language in your programs. You'll explore grammars and how they can be used to analyse text. You'll learn how to use statistical analysis to extract information from and classify text. You'll use appropriate programming libraries to implement NLP workflows.

Physical Computing and the Internet of Things

Studying this module will introduce the technology involved in the development and programming of hardware devices that can sense and act in the environment. It explains and demonstrates how the environment, which is inherently continuous, can be monitored by analogue electrical and mechanical sensors, then captured and analysed using a computer, which is a discrete system. A focus of this module is the interface between the digital and the analogue. You'll learn basic physics, electronics, programming and software engineering. The module's practical objective is the development of the skills needed for designing and building interactive physical devices.

Virtual Reality

The Virtual Reality (VR) module combines the theory and psychology of VR with practical development skills. You'll learn the skills needed to design compelling VR environments and the skills that apply to creative practice, science and industry. This module gives you the skills needed to develop VR, including understanding the basic theory of presence in VR, which underlies the basic design principles. Using a 3D engine to create interactive virtual environments, you'll also learn practical development skills, including creating 3D environments, designing and implementing 3D interaction for VR and building social VR experiences with interactive virtual characters.

Final Project

In this module, you'll undertake a substantial independent project that allows you to demonstrate a wide range of skills such as project planning, management, research, software implementation and written presentation. **If you are enrolled on a specialist pathway as part of the BSc, you'll be expected to undertake a project in your specialist area.** You will integrate your knowledge gained throughout the degree and use skills acquired in other modules in the implementation of your final project. The work will consist of a combination of research and software development. You will be expected to use methodologies from various components of computer science, including your specialist pathway if appropriate.

Entry requirements

An accessible programme for Computer Scientists

To register for one of the suite of BSc Computer Science degrees, you will need to satisfy our entry requirements.

We welcome qualifications from across the world, which are equivalent to UK GCSEs and A levels. Certain minimum requirements are needed in mathematics and English language, for further information visit:
london.ac.uk/computer-science

Performance-based admission
This degree is also open to those with non-traditional qualifications. If you successfully complete two specified Level 4 modules, you can automatically enrol on the full BSc degree. Further details are at:
london.ac.uk/computer-science

Recognition of prior learning
If you hold professional or academic qualifications that compare closely with the BSc Computer Science modules, we may be able to accredit them as prior learning, so you do not have to study those module(s) to complete the degree.

Accessibility
The University of London welcomes applications from disabled students and/or those who have access requirements. Due to the highly interactive and interoperability of this programme, some students may find some activities challenging.

If you're disabled and/or have access requirements, we will make every reasonable effort to meet your needs. This may include making access arrangements for examinations such as a separate room or special aids. If you would like to tell us about your disability and/or request access arrangements, please complete the relevant section of the application form or contact the Inclusive Practice Manager at:
special.arrangements@london.ac.uk

Computer requirements
To get the most out of this degree, your computer needs to reach certain requirements. These can be found in the 'Programme Specification' section at:
london.ac.uk/computer-science
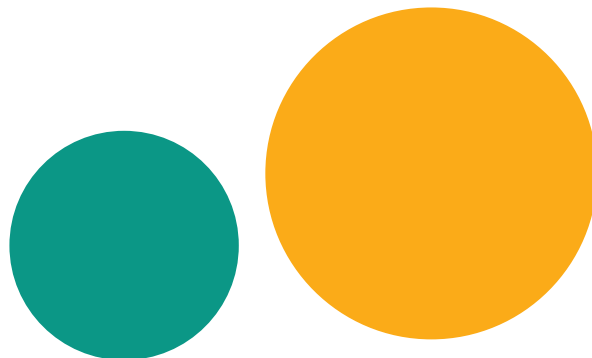
Fees and funding

Gain a prestigious University of London qualification at outstanding value

The degree fee varies depending on a number of factors, which include:

• where you live

• whether you receive online or face-to-face tutor support.

Our module fees include access to study materials and all coursework submissions. However, you will be required to pay an additional fee directly to your local examination centre when sitting written examinations. More details are available at: london.ac.uk/computer-science

Undergraduate loans
Information regarding Undergraduate loans can be obtained at: london.ac.uk/computer-science

Employer sponsorship
If you are already in employment and apply to do this degree, your employer may be willing to help with the cost. Visit: london.ac.uk/employers for information about the University of London and the benefits of sponsorship.

Your University of London qualification

About your qualification

When you graduate you will receive your Final Diploma and a Diploma Supplement.

The Final Diploma

The Final Diploma states that:

- you were awarded a University of London degree, diploma or certificate

- Goldsmiths, University of London, was your education provider.

- It also includes the University of London crest and the Vice-Chancellor's signature.

If for any reason you're unable to finish your BSc degree, you may be eligible for an exit award. If you have at least 120 credits, you'll be awarded a Certificate of Higher Education in Computer Science. Alternatively, if you achieve 240 credits or more, with a minimum of 90 credits at Level 5, you'll be awarded a Diploma of Higher Education in Computer Science.

The Diploma Supplement includes the following information:

- The award you successfully completed.

- Your transcript of modules taken, marks achieved and overall classification.

- The role of Goldsmiths, University of London.

Although our qualifications are recognised across the globe, some country authorities and regulators may not recognise them. We advise that you check on the recognition status in your country before enrolling.

This material is available in alternative formats upon request.
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