MATHEMATICAL COMPUTATION
MEng /
UCAS CODE: G430
2021 ENTRY

www.ucl.ac.uk/prospectus
This MEng is aimed at a small cohort of students with strong mathematical ability. The programme focuses on theoretical computer science and equips you with the ability to model complex systems and represent, manipulate, and analyse the vast amounts of data and knowledge required to solve massively complex problems.

**Key information**

**Programme starts**
September 2021

**Location**
London, Bloomsbury

**Degree benefits**

- Our degree programmes are designed and taught by world-class researchers, ensuring our material is cutting-edge.
- The Computer Science department was ranked #1 in the UK in the most recent Research Excellence Framework (REF) review which assesses the quality of research in UK Higher Education Institutes.
- Our location in the centre of London strengthens our close associations with industry and the financial sector, and offers you extensive opportunities for developing contacts with potential employers.

**Degree structure**

In each year of your degree you will take a number of individual modules, normally valued at 15 or 30 credits, adding up to a total of 120 credits for the year. Modules are assessed in the academic year in which they are taken. The balance of compulsory and optional modules varies from programme to programme and year to year. A 30-credit module is considered equivalent to 15 credits in the European Credit Transfer System (ECTS).

The programme will cover a wide range of mathematical topics underpinning the analysis of computational systems including logic, discrete mathematics, information theory, probability and statistics. With this foundation, you will investigate methods for representing, manipulating and reasoning with the vast amounts of data and knowledge available to modern computers. The mathematical content is deeper and more substantial than in our other computer science programmes. Practical problem-solving will mesh with this deeper theoretical work, and you will also take part in regular reading groups and seminars solely for Mathematical Computation students.

In the third and final years you may choose from a wide range of specialist options including game theory, artificial intelligence, graph theory, evolutionary computation, machine learning, dynamical systems and cryptography.

In the final year you will produce a dissertation in a subject of your choice.

Upon successful completion of 480 credits, you will be awarded a MEng (Hons) in Mathematical Computation.

Please note that the list of modules given here is indicative. This information is published a long time in advance of enrolment and module content and availability is subject to change.

**YEAR ONE**

**Compulsory module(s)**

- Algebra 1
- Algebra 2
- Algorithms
- Compilers
- Mathematical Methods 1
- Object Oriented Programming
- Principles of Programming
- Theory of Computation

**Optional modules**

- All first year modules are compulsory.
## Year Two

**Compulsory modules**

- Algebra 3: Further Linear Algebra
- Directed Reading
- Logic and Database Theory
- Mathematical Methods 2
- Number Theory
- Computer Architecture and Concurrency
- Probability and Statistics
- Security

**Optional modules**

- All second year modules are compulsory.

## Year Three

**Compulsory modules**

- Computability and Complexity Theory
- Computer Systems
- Introduction to Cryptography

**Optional modules**

You will select optional modules from a wide range available both within and outside UCL Computer Science. Optional modules within UCL Computer Science modules may include:

- Artificial Intelligence and Neural Computing
- Computer Graphics
- Functional Programming
- Game Theory
- Image Processing
- Interaction Design
- Machine Learning for Domain Specialists
- Networked Systems

## Final Year

**Compulsory module(s)**

- Individual Project (Master’s Level)

**Optional modules**

You will select modules from a wide range of Master’s level mathematics and computer science options. Options may include:

- Affective Computing and Human-Robot Interaction
- Bioinformatics
- Financial Institutions and Markets
- Information Retrieval and Data-Mining
- Applied Cryptography and Cryptanalysis
- Machine Vision
- People and Security
- Virtual Environments

## Your learning

Modules usually last for one term and include a mixture of lectures, tutorials and lab classes. There is a focus on practical problem-based learning and group work. From the very first week of teaching you will find yourself applying theory and working with others on solving real and challenging problems. Pastoral care and monitoring is offered to all students through a personal tutorial system.

## Assessment

Student performance is continually monitored and a variety of assessment methods are employed across the full range of modules within the department, including unseen written examinations, individual and group courseworks. All students will also take an individual project module.

## Accessibility

Details of the accessibility of UCL buildings can be obtained from AccessAble. Further information can also be obtained from the UCL Student Support & Wellbeing team.

## Your career

The strong practical and analytical skills developed during your studies will leave you well placed to meet the growing global demand for graduates in this fast-moving industry.

Our graduates have previously secured careers with global IT consultancies, as IT analysts with City of London banks and as IT specialists with manufacturing industries. As well as these pathways, the UCL Mathematical Computation MEng will provide you with an excellent foundation for a broad spectrum of different careers.

## Your application

Application for admission should be made through UCAS (the Universities and Colleges Admissions Service). Applicants currently at school or college will be provided with advice on the process; however, applicants who have left school or who are based outside the United Kingdom may obtain information directly from UCAS.

In addition to academic requirements, we are looking for you to demonstrate a proven interest in computing and a clear understanding of what studying mathematical computation entails. We are keen to admit students with an interest in subjects that relate to applications of computer technology.

Applications are firstly assessed by UCL Admissions officers against the published entry criteria. Applicants with non-standard qualifications or applications from mature applicants are referred onto the Computer Science Admissions Tutor for review.
Entry requirements

**A LEVELS**

**Standard Offer:** A*A*A. Mathematics with A* required and Further Mathematics preferred.

**GCSE:** English Language and Mathematics at grade C or 5. For UK-based students, a grade C or 5 or equivalent in a foreign language (other than Ancient Greek, Biblical Hebrew or Latin) is required. UCL provides opportunities to meet the foreign language requirement following enrolment, further details at: www.ucl.ac.uk/ug-reqs.

**Contextual Offer:** A*AB. Mathematics with A* required and Further Mathematics preferred.

**GCSE:** English Language and Mathematics at grade C or 5. For UK-based students, a grade C or 5 or equivalent in a foreign language (other than Ancient Greek, Biblical Hebrew or Latin) is required. UCL provides opportunities to meet the foreign language requirement following enrolment, further details at: www.ucl.ac.uk/ug-reqs.

**IB DIPLOMA**

**Standard Offer:** 40 points. A total of 20 points in three higher level subjects including grade 7 in Mathematics, with no score below 5.

**Contextual Offer:** 38 points. A total of 18 points in three higher level subjects including grade 7 in Mathematics, with no score below 5.

**CONTEXTUAL OFFERS – ACCESS UCL SCHEME**

As part of our commitment to increasing participation from underrepresented groups, students may be eligible for a contextual offer as part of the Access UCL scheme. For more information see www.ucl.ac.uk/prospectus.

**OTHER QUALIFICATIONS**

UCL considers a wide range of UK and international qualifications for entry into its undergraduate programmes. Full details are given at: www.ucl.ac.uk/otherquals.

**UNDERGRADUATE PREPARATORY CERTIFICATES (International foundation courses)**

UCL Undergraduate Preparatory Certificates (UPCs) are intensive one-year foundation courses for international students of high academic potential who are aiming to gain access to undergraduate degree programmes at UCL and other top UK universities.

Typical UPC students will be high achievers in a 12-year school system which does not meet the standard required for direct entry to UCL.

For more information see: www.ucl.ac.uk/upc.

**TUITION FEES**

The fees indicated are for undergraduate entry in the 2021/22 academic year. The UK fees shown are for the first year of the programme at UCL only. Fees for future years may be subject to an inflationary increase. The Overseas fees shown are the fees that will be charged to 2021/22 entrants for each year of study on the programme, unless otherwise indicated below.

- **UK & EU:** £9,250 (2021/22)
- **Overseas:** £34,100 (2021/22)

Full details of UCL’s tuition fees, tuition fee policy and potential increases to fees can be found on the UCL Students website.

**ADDITIONAL COSTS**

A guide including rough estimates for these and other living expenses is included on the UCL Fees and funding pages. If you are concerned by potential additional costs for books, equipment, etc., please get in touch with the relevant departmental contact (details given on this page).

**FUNDING**

Various funding options are available, including student loans, scholarships and bursaries. UK students whose household income falls below a certain level may also be eligible for a non-repayable bursary or for certain scholarships. Please see the Fees and funding pages for more details.

**CONTACT**

Prof Ingemar Cox

Email: undergrad-admissions@cs.ucl.ac.uk

Telephone: +44 (0)20 3108 6873

Department: Computer Science

**UK withdrawal from the EU**

For up-to-date information relating to specific key questions following the UK’s withdrawal from the EU, please refer to: www.ucl.ac.uk/brexit.