MATHEMATICS AND PHYSICS
BSc /
UCAS CODE: GF13
2018 ENTRY

www.ucl.ac.uk/prospectus/maths
Physics and mathematics are inextricably linked. It is not really possible to understand the basic concepts of physics such as elementary particle theory without a strong grounding in both pure and applied mathematics. This BSc combines the study of mathematics and physics on an equal basis, each reinforcing the other.

### Key information

**Programme starts**
September 2018

**Location**
London, Bloomsbury

### Degree benefits

- Gain transferable skills such as numeracy, problem-solving and logical thinking, which can lead to a large variety of interesting, diverse and well-paid careers.
- Internationally renowned UCL Mathematics is home to world-leading researchers in a wide range of fields, especially geometry, spectral theory, number theory, fluid dynamics and mathematical modelling.
- Three of the six British winners of the Fields medal (the mathematician’s equivalent of the Nobel Prize) have associations with the department.
- UCL Physics & Astronomy was rated 4th in the last UK Government Research Excellence Framework (REF)

### Research Excellence Framework (REF) 2014

The Research Excellence Framework, or REF, is the system for assessing the quality of research in UK higher education institutions. The 2014 REF was carried out by the UK’s higher education funding bodies, and the results used to allocate research funding from 2015/16.

- 82% rated 4* (‘world-leading’) or 3* (‘internationally excellent’)

Learn more about the scope of UCL’s research, and browse case studies, on our [Research Impact website](#).

### Degree structure

In each year of your degree you will take a number of individual modules, normally valued at 0.5 or 1.0 credits, adding up to a total of 4.0 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 1.0 credit is considered equivalent to 15 credits in the European Credit Transfer System (ECTS).

In the first and second years of the programme you will cover a balanced selection of modules in both UCL Mathematics and UCL Physics & Astronomy. Having laid the basic foundations there is a wide range of modules from both subjects in the third year of the degree. Most of the modules will be selected from those followed by single-subject students. Students taking this programme do not have to do any practical work, although this is possible if so desired.

This programme is offered as a three-year BSc or a four-year MSci degree. The first two years of the programme are identical, and students are advised to apply for the MSci degree in the first instance, as it is possible to transfer to the BSc during the first three years.

#### YEAR ONE

**Core or compulsory module(s)**

- Mathematics modules:
  - Algebra for Joint Honours Students
  - Analysis 1
  - Mathematical Methods 1
  - Mathematical Methods 2
- Physics and astronomy modules:
  - Classical Mechanics
  - Physics of the Universe
  - Thermal Physics
  - Waves, Optics and Acoustics

**Optional modules**

- All first year modules are compulsory.

#### YEAR TWO

**Core or compulsory module(s)**

- Mathematics modules:
  - Analysis 3: Complex Analysis
  - Fluid Mechanics
  - Mathematical Methods 3
- Physics astronomy modules:
  - Atomic and Molecular Physics
  - Electricity and Magnetism
  - Quantum Physics
  - Statistical Thermodynamics

**Optional modules**

- You will select one of the following 0.5 credit mathematics modules:
  - Analytical Dynamics
  - Mathematical Methods 4
All final-year modules are optional. Currently available mathematics options are described on the UCL Mathematics website.

You will select:
- 1.5 credits from the following physics options:
  - Electromagnetic Theory
  - Nuclear and Particle Physics
  - Quantum Mechanics
  - Solid State Physics
- 1.0 credit from third-year mathematics options
- 1.0 credit from suitable physics or third-year mathematics options
- 0.5 credits of physics, third-year mathematics or approved outside options

Teaching is mainly carried out through lectures and small-group tutorials. Problem classes allow you to exercise the skills you have learned. In addition, an ‘office hours’ system for each programme allows you to meet with tutors on a one-to-one basis to review parts of the degree that you find interesting or need clarifying. A Student Mentor scheme runs in the department offering support and advice to first-years.

Most modules are assessed by two-hour written examinations in the third term, with a small element (10%) of coursework assessment.

We aim to develop your skills in mathematical reasoning, problem-solving and accurate mathematical manipulation. You will also learn to handle abstract concepts and to think critically, argue logically and express yourself clearly.

A mathematics degree is highly valued by employers due to the skills in logical thinking, analysis, problem-solving and, of course, numeracy, that it develops.

First career destinations of recent graduates (2013-2015) of Mathematics and Physics programmes at UCL include:
- Full-time student, MASt in Applied Mathematics and Theoretical Physics at the University of Cambridge
- Investment Analyst, Aon Hewitt
- Mathematics MSc, UCL

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 expect you to demonstrate an understanding and enjoyment of the subject beyond the examined syllabus, through your reading and involvement in problem-solving activities. Evidence of your curiosity and perseverance in tackling puzzles, and your enjoyment of logical and abstract thinking, should be shown in your application.

If your application is sufficiently strong you will be invited to visit the department for an applicant afternoon. Alternatively, some invitations are for an academic interview. You will also be able to talk to current students and staff and will be given a tour.
Entry requirements

**A LEVELS**

**Grades**
A*A*A, or A*AA and a 1 in any STEP paper or distinction in Mathematics AEA

**Subjects**
Mathematics and Further Mathematics required at A*, or one of Mathematics or Further Mathematics at A* if STEP or AEA offered. Physics also required.

**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**

**Points**
39-40 overall.

**Subjects**
A score of 20 points in three higher level subjects including 7 in Mathematics and at least 6 in Physics, or 19 points in three higher level subjects including 7 in Mathematics and at least 6 in Physics and a 1 in any STEP paper or a distinction in Mathematics AEA, with no score below 5.

**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)**
The 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 2018/19 academic year. The UK/EU fees shown are for the first year of the programme at UCL only. The Overseas fees shown are the fees that will be charged to 2018/19 entrants for each year of study on the programme, unless otherwise indicated below.

// UK & EU: £9,250 (2018/19)
// Overseas: £22,790 (2018/19)

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

**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**
Dr Robert Bowles

Email: admissions@math.ucl.ac.uk

Telephone: +44 (0)20 7679 3501

Department: Mathematics

**EU referendum**
For up-to-date information relating to specific key questions following the UK’s decision to leave the EU, please refer to: www.ucl.ac.uk/eu-referendum

**Disclaimer**
This information is for guidance only. It should not be construed as advice nor relied upon and does not form part of any contract. For more information on UCL’s degree programmes please see the UCL Undergraduate Prospectus at www.ucl.ac.uk/prospectus