Theoretical Physics MSci /

This four-year programme offers an additional year of study on top of the Theoretical Physics BSc, during which students have the opportunity to specialise further by taking advanced optional modules, and undertaking a research project.

Key information

Programme starts
September 2019

Location
London, Bloomsbury

Degree benefits

// A science degree from UCL is a strong asset across the whole range of careers where basic scientific skills are required, from accountancy to astrophysics, and computing to cryogenics.

// The programme is accredited by the Institute of Physics (IOP) and includes the very latest developments and discoveries in the field, based on our highly rated research.

// Collaborative links with both industry and international research laboratories provide insight into the practical application of your studies.

// A wide range of optional modules are available, including modules from other University of London colleges, which allows for individual preferences and specialisations within your degree.

Accreditation

This programme is accredited by the Institute of Physics. Holders of accredited degrees can follow a route to Institute of Physics membership and the Chartered Physicist (CPhys) professional qualification. Graduates of accredited Integrated Master’s (MPhys or MSci) degrees have fulfilled the educational requirements for CPhys status, while graduates of accredited Bachelor’s (BSc) degrees have partially fulfilled these requirements.

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).

Core modules in the first year provide a firm foundation in quantum and classical physics, underpinned by mathematics and a practical skills module which includes computing skills training. You will also take a module in practical mathematics.

The second year includes core modules in quantum physics and its application to atoms and molecules, in statistical thermodynamics and in electromagnetic theory, along with further mathematics. The quantum and condensed matter elements of the core are completed in the third year. Students reading for the Theoretical Physics degree replace second and third-year experimental work with theory modules.

The third year also includes optional modules to develop further and enhance knowledge of a range of physics topics. The fourth year comprises a compulsory research project, and a further five half-credit modules, generally chosen from subjects in the relevant degree specialty.

This programme is offered both as a three-year BSc and a four-year MSci, with common structures and subjects for the first two years. However, the additional fourth year of the MSci programme allows for a greater depth of study and we recommend you apply for an MSci initially, as this keeps more options open.

YEAR ONE

Core or compulsory module(s)

// Classical Mechanics
Mathematical Methods I
Mathematical Methods II
Physics of the Universe
Practical Mathematics I
Practical Skills 1C
Thermal Physics
Waves, Optics and Acoustics

Optional modules

// All first-year modules are compulsory.

YEAR TWO

Core or compulsory module(s)

// Atomic and Molecular Physics
Electricity and Magnetism
Mathematics for Physics and Astronomy
Mathematical Methods for Theoretical Physics
Mathematical Methods III
Practical Mathematics 2
Quantum Physics
Statistical Thermodynamics

Optional modules

// All second-year modules are compulsory.
In addition to the subjects and grades specified in the qualifying examinations, we are also looking for evidence of self-motivation and an enthusiastic interest in the subject. This may be demonstrated through paid or voluntary work experience, academic project work, or your interests and hobbies beyond the school curriculum.

Your application will be carefully assessed based on your UCAS form and reference. If you are made an offer and based in the UK within a reasonable travelling distance of UCL, you will be invited to a compulsory applicant open day. This will include presentations, a tour of facilities and an opportunity to meet current students and staff members.

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<tr>
<th>YEAR THREE</th>
<th>Final Year</th>
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<tbody>
<tr>
<td>Core or compulsory module(s)</td>
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<tr>
<td>// Electromagnetic Theory</td>
<td>// Physics Project</td>
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<td>// Group Project</td>
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<tr>
<td>// Nuclear and Particle Physics</td>
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<td>// Quantum Mechanics</td>
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<td>// Solid State Physics</td>
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<tr>
<td>Optional modules</td>
<td>Optional modules</td>
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<td>// You will select your remaining 1.5 credits from a wide range of optional modules. Options may include:</td>
<td>// You will select 2.5 credits from a wide range of optional modules.</td>
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<td>// Energy and Climate</td>
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<td>// Fluid Mechanics</td>
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<td>// Lasers and Modern Optics</td>
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<tr>
<td>// Mathematics for General Relativity</td>
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<tr>
<td>// Physical Cosmology</td>
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<tr>
<td>// Physics of Oceans, Ice Sheets and Climate (1.0 credits)</td>
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<tr>
<td>// Scientific Computing Using Object Oriented Languages</td>
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<tr>
<td>// Theory of Dynamical Systems</td>
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**Your learning**

Teaching is delivered through lectures, laboratory (and as appropriate, observatory) practical sessions, and supervised problem-solving tutorials. These tutorials are designed to deal with lecture-based questions, enlarge on topics addressed in lectures, and allow clarification and in-depth discussion of new concepts.

**Assessment**

Assessment will normally involve end-of-year examinations, and an element of assessed coursework. Practical work you will be continuously assessed.

**Your career**

Your scientific training will equip you with an understanding of mathematics, and of physical principles and techniques, as well as transferable skills in analysis, rational argument and innovative problem solving. Surveys by the IOP indicate that physicists’ versatility is welcomed by a vast range of professions.

Around half our graduates choose to pursue further study for an MSc or PhD. A PhD opens up the possibility of an academic or research career in a university or research institute. Alternatively, like many of our graduates, you may consider employment in research, design, development, computing, finance, marketing and teaching, among others.

First career destinations of recent graduates (2013-2015) of Theoretical Physics programmes at UCL include:

// Software Engineer, British Telecom (BT)

// Full-time student, PhD in Physics and Astronomy at UCL

// Graduate Software Engineer, IBM

// Full-time student, PhD in Physics at the University of Cambridge

**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.
Entry requirements

A LEVELS


Contextual Offer: Contextual offer not available.

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-requirements

IB DIPLOMA

Standard Offer: 38. A total of 18 points in three higher level subjects including Mathematics and Physics at grade 6, with no score below 5.

Contextual Offer: Contextual offer not available.

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 2019/20 academic year. The UK/EU 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 2019/20 entrants for each year of study on the programme, unless otherwise indicated below.

// UK & EU: £9,250 (2019/20)
// Overseas: £26,740 (2019/20)

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

If you are concerned by potential additional costs for books, equipment, etc. on this programme, 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

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Department: Physics and Astronomy

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/ucl-and-europe

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