THEORETICAL PHYSICS MSc / UCAS CODE: F345 2018 ENTRY

www.ucl.ac.uk/prospectus/physics
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 2018

**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.

**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.

- 90% 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.

**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 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).

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.
YEAR THREE

Core or compulsory module(s)

- Electromagnetic Theory
- Group Project
- Nuclear and Particle Physics
- Quantum Mechanics
- Solid State Physics

Optional modules

- You will select your remaining 1.5 credits from a wide range of optional modules. Options may include:
- Energy and Climate
- Fluid Mechanics
- Lasers and Modern Optics
- Mathematics for General Relativity
- Physical Cosmology
- Physics of Oceans, Ice Sheets and Climate (1.0 credits)
- Scientific Computing Using Object Oriented Languages
- Theory of Dynamical Systems

FINAL YEAR

Core or compulsory module(s)

- Physics Project

Optional modules

- You will select 2.5 credits from a wide range of optional modules.

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 wider range of professions than any other subject.

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 Tester, Tynemarch Systems
- Full-time student, PhD in Physics and Astronomy at UCL
- Full-time student, PhD in Theoretical Particle Physics at the University of Edinburgh
- Software Engineer, British Telecom (BT)
- Graduate Software Engineer, IBM

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 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.

Data taken from the 'Destinations of Leavers from Higher Education' survey undertaken by HESA looking at the destinations of UK and EU students in the 2013-2015 graduating cohorts six months after graduation.
**Entry requirements**

**A LEVELS**
**Grades**
AAA

**Subjects**
Mathematics, Physics and Further Mathematics required.

**GCSE**
English Language and Mathematics at grade C. For UK-based students, a grade C 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**
36 overall.

**Subjects**
A total of 18 points in three higher level subjects including Mathematics and Physics at grade 6, 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.

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**TUITION FEES**
The fees indicated are for undergraduate entry in the 2017/18 academic year and are for the first year of the programme at UCL only. Fees for 2018 entry will appear here as soon as they are available.

- UK & EU: £9,250 (2017/18 - see below)
- Overseas: £23,710 (2017/18)

The UK/EU fee quoted above may be subject to increase for the 2018/19 academic year and for each year of study thereafter and UCL reserves the right to increase its fees in line with UK government policy (including on an annual basis for each year of study during a programme). Fees for overseas students may be subject to an annual increase in subsequent years of study by up to 5%.

Please see the full details of UCL’s fees and possible changes on the UCL Current Students website.

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**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.

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**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

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In case of any ambiguity or discrepancy, please refer to the UCL website.