MATHEMATICAL AND PHYSICAL SCIENCES

"The two most important things that drew my attention to UCL were the fact that the university is internationally renowned for its active research areas and also that it is located right in the heart of central London. Until my enrolment at UCL, I knew that I wanted to work for a global health community but didn't know how or where to start. By reading assigned literature related to my courses, I have now learnt that there are truly diverse and interesting ways in which I can be involved. It has definitely opened so many more doors of career options in my life.

Study Abroad really has equipped me with so much useful knowledge, not only in terms of academia but also of life in general."

Kayla Song
University of Toronto
Toronto, Canada

CHEMISTRY

One of UCL's founding departments, UCL Chemistry is one of the UK's premier Chemistry departments as judged by the UK government's 2008 Research Assessment Exercise. The 1904 Nobel Prize in Chemistry was awarded to Sir William Ramsay for the discovery of five noble gases at UCL.

Why study Chemistry at UCL?

Research carried out in the Chemistry Department is at the forefront in areas such as chemical biology, nanotechnology, materials and computational chemistry and your professors are leaders in these fields. The department is equipped with modern undergraduate laboratories and you have access to research centres such as the London Centre for Nanotechnology.

What you will gain from study at UCL

You will benefit from the exposure to new ideas and areas of research and the diversity of skills that we expect students to develop as part of the assessment process. Courses draw on the interdisciplinary aspect of modern chemistry and you will gain an insight into the interactions between disciplines.

Teaching and Assessment

Many courses involve three components: formal lectures, weekly tutorials and laboratory work. Students admitted for the Fall Term only will be assessed by a special departmental examination at the end of their studies in December. UK chemistry degrees have a vertical structure and therefore courses at higher levels normally ask for specific prior study.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

Professor D A Tocher
EMAIL d.a.tocher@ucl.ac.uk
TEL +44 (0)20 7679 4709

Availability

Year
Fall Term
Spring Term

Tuition Fees

£18,500 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Biochemical Engineering, page 78
- Chemical Engineering, page 80
- Molecular Biosciences, page 106

LEVEL 1 COURSES

CHEM1101

Basic Inorganic Chemistry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course involves lectures, tutorials and laboratory work. Lecture topics include the solid state, transition metal chemistry, and the chemistry of phosphorus.

CHEM1201

Basic Organic Chemistry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A broad introductory course covering alkanes, cycloalkanes, alkyl halides, alkenes, alkynes, aromatic chemistry, alcohols, ethers, aldehydes and ketones and carboxylic acids.

CHEM1301

Basic Physical Chemistry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course involves lectures, tutorials and laboratory work. Lecture topics include kinetic theory of gases, quantum chemistry, statistical thermodynamics and thermodynamics.

CHEM2101

Fundamentals of Inorganic Chemistry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Covers the same material as CHEM1101 but does not involve laboratory work. Rather, there is an additional set of lectures on 'Metals in Medicine'.

LEVEL 2 COURSES

CHEM2001

Chemistry of Materials

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

The course addresses how technologically important properties of materials arise from their bonding, structure and defects. CHEM1301 or equivalent is a prerequisite.

CHEM2102

Inorganic Chemistry

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Explores in detail both main group and transition metal chemistry with an underlying theme of the applications of group theory. CHEM1101 (or equivalent) is a prerequisite.

continues

CHEM2201

Organic Chemistry

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Content includes synthesis, reactivity, structure determination and mechanism in organic chemistry and biologically important molecules. CHEM1201 (or equivalent) is a prerequisite.

CHEM2203

Reaction Mechanisms in Chemical and Biological Systems

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Provides insight into the methods by which organic reaction mechanisms are studied, as well as knowledge of reaction mechanisms in enzymic and non-enzymic systems.

CHEM2301

Physical Chemistry

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Covers quantum mechanics, thermodynamics, molecular spectroscopy, kinetics and electrochemistry. CHEM1301 (or equivalent) is a prerequisite.

CHEM2304

Quantum Mechanics and Spectroscopy

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course covers the topics of quantum mechanics, thermodynamics and spectroscopy. CHEM1301 (or equivalent) is a prerequisite.

CHEM2601

Chemistry of Biologically Important Molecules

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Covers the most important classes of biologically important molecules and provides an understanding of their structure and conformation. CHEM1201 (or equivalent) is a prerequisite.

STUDENT VIEW

Hanna Kuberczyk

California Institute of Technology, USA

"As my interests lie not only in chemistry, but also biology, I like the flexibility – I can choose classes outside of my department which are suited to my broader interests. I believe that studying abroad will broaden my cultural horizons. I can interact with people from all around the world, see things in a new light. The stay in London has given me plenty of opportunities of access to culture at its highest – a very enriching experience which adds to my sense of well-roundedness.

I would recommend UCL to everybody. It's one of the best universities in the UK, with top staff in their field. Because of my experience here, I will certainly consider coming back for graduate study."

EARTH SCIENCES

UCL Earth Sciences enjoys world-class facilities accessible to students at all levels. These include hosting the UK's only NASA Regional Planetary Image Facility, use of the University of London Observatory, and extensive collaboration with the Royal Institution and the Natural History Museum. World-class research is used in course development.

Why study Earth Sciences at UCL?

Both our teaching and research have scored highly in government assessments. We maintain excellent, informal relations between staff and students by keeping class sizes small, so your tutors really get to know you, and can help build on your strengths; and also through the active and popular Greenough Society, which organises field trips, lectures and social events.

What you will gain from study at UCL

You will have the freedom to choose from a wide range of courses, including field-based courses, and may elect to attend a course taught in a different UCL department. Students with sufficient prior knowledge may be able to take Level 3 and 4 courses, and should contact the Affiliate Tutor for details. Many of these are project- or field-based, thereby offering unique skills training.

Teaching and Assessment

Assessment is based on written examination and coursework. Examinations are held in May; semester-only students are offered alternative assessment.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

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Availability

Year
Fall Term
Spring Term

Tuition Fees

£18,500 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Physics and Astronomy, page 117
- Geography, page 151

LEVEL 1 COURSES

GEOL1001

Earth Materials

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Though a series of linked practicals and lectures, the course introduces students to the chemistry and physical properties of minerals.

GEOL1002

From Petrology to Petrogenesis

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course introduces the principal building blocks of Earth Sciences: rocks, minerals and their composition, formation and origins.

GEOL1003

History of Life

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Discusses the development of life on Earth and the way in which life and the physical environment have interacted through 3,800 million years of Earth's history.

GEOL1004

Dynamic Earth

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course introduces Earth as a planet and examines principal geophysical and geological phenomena.

GEOL1012

Surface Processes

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course demonstrates the immensity of surface processes and resulting changes on Earth and other planets through geological time.

GEOL1013

The Earth

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an integrated introduction to understanding the Earth including: Earth's origin and formation; Earth's composition and dynamics; and Earth's evolution and history.

continues

GEOL1014

Geochemistry

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

The course will provide an introduction to the principles of chemistry required for considering the fundamental geochemical processes operating in the Earth system.

GEOL1015

Geology of Planetary Bodies

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Designed to introduce students to the geological histories and geological processes of other planets.

LEVEL 2 COURSES

GEOL2004

Chemistry of Earth Environments

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Outlines chemical aspects of the Earth's formation and development to its present state.

GEOL2008

Vertebrate Palaeontology and Evolution

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an introduction to the major vertebrate groups and evolutionary relationships of these groups.

GEOL2009

Surface Processes and Structures

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course provides an understanding of sedimentary rocks and depositional environments. Fieldwork is carried out over the Easter vacation.

GEOL2014

Global Geophysics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an understanding of the use of geophysics for investigating solid Earth structure and processes.

GEOL2016

Atmosphere, Weather and Climate

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An up-to-date introduction to meteorology, including a description of the Earth's atmosphere, weather processes, and climatic conditions.

GEOL2024

Petrology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Aims to provide students with a basic understanding of the nature and origin of crustal-forming igneous and metamorphic rocks, their formation and their tectonic settings.

GEOL2025

Petrography

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Aims to provide students with the ability to identify and interpret igneous, metamorphic and sedimentary rocks in hand specimen and thin section.

GEOL2026

Maps, Images and Structures

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course enables students to analyse geological maps and begin to observe, record and interpret geological outcrops in the field.

GEOL2027

Structural Geology and Tectonics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Topics include: concepts of stress and strain; brittle and ductile deformation of rocks; state of stress in the crust and lithosphere; extensional and compressional tectonics.

LEVEL 3 COURSES

GEOL3003

Geodynamics and Global Tectonics

Availability	Year
Credit Value	8 (US) 15 (ECTS)

This couse covers a thorough review of global tectonic phenomena and the dynamical processes that drive them.

GEOL3036

Biodiversity and Macroevolutionary Patterns

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Explanation of the techniques used to construct and test evolutionary trees. Use of such trees to study fossil record quality, biodiversity, morphological evolution, etc.

GEOL3038

Experimental Methods in Water-Rock Interaction

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Introduces the theory, methodology, applications and limitations of a range of laboratory- and field-based experimental methods used to investigate problems involving water-rock interaction.

GEOL3039

Physics of Oceans, Ice Sheets and Climate

Availability	Year
Credit Value	8 (US) 15 (ECTS)

Mean oceanic circulation; Geodesy and the shape of the Earth; Surface topography of the ocean determined from satellites; Planetary equilibrium temperature and the greenhouse effect.

GEOL3040

Basin Evolution, Stratigraphy and Economic Aspects

Availability	Spring Term
Credit Value	8 (US) 15 (ECTS)

An up-to-date perspective on some of the latest and most exciting aspects of the 'geological' framework of crustal evolution and dynamics. Fieldwork is carried out over the Easter vacation.

MATHEMATICS

Mathematics encapsulates ideas of rigour, proof and abstraction. Mathematics degrees are intellectually demanding and the rewards are enormous, both for the understanding of mathematics they bring, and for their application in other subjects.

Why study Mathematics at UCL?

The department is the third oldest Mathematics department in England. It has a very high rating for teaching and research in UK government assessments. UCL has provided three of the six British winners of the Fields Medal. We have over ten nationalities on our staff, which represents a selection from the best of world mathematics.

What you will gain from study at UCL

You will be able to choose from courses which range from the most elementary to the most advanced. Our students, past and present, tell us we are friendly and informal, and that they really appreciate the personal attention the staff are able to give them. They also report having found the staff's commitment to their subject both infectious and stimulating.

Teaching and Assessment

As far as possible, you will be treated the same as the undergraduate students enrolled on our full degree programmes. Teaching is by lecture and tutorial, assessment is by examination and assessed coursework.

Prerequisite knowledge will apply to all courses, across a range of breadth and depth. Please consult the website above, and follow links to the Mathematics Department website to ascertain what is required for the course(s) you are interested in, and check with the Affiliate Tutor if you are still uncertain.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

Robert Bowles
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Availability

Year
Fall Term
Spring Term

Tuition Fees

£14,000 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Physics and Astronomy, page 117
- Statistical Science, page 126
- Economics, page 148

LEVEL 1 COURSES

MATH1101

Analysis 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A first course on formal analysis. Starting only with the basic properties of real numbers, rigorous proofs are given of the main results in elementary differential calculus.

MATH1102

Analysis 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Analysis in calculus, differentiation and integration.

MATH1201

Algebra 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Algebra and Discrete mathematics, Linear Algebra.

MATH1202

Algebra 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Groups and Linear Algebra.

MATH1203

Algebra for Joint Honours Students

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Groups and Linear Algebra.

MATH1301

Applied Mathematics 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A first course in applied mathematics.

MATH1302

Applied Mathematics 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Newtonian dynamics of point particles.

continues

MATH1401

Mathematical Methods 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Vectors and Calculus.

MATH1402

Mathematical Methods 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Calculus of several variables.

LEVEL 2 COURSES

MATH2101

Analysis 3: Complex Analysis

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Rigorous treatment of functions of a complex variable.

MATH2201

Algebra 3: Further Linear Algebra

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An advanced course on Linear Algebra, in which the topics covered have applicability in many areas of mathematics.

MATH2301

Fluid Mechanics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A first course in inviscid fluid mechanics.

MATH2401

Mathematical Methods 3

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course on Partial Differential Equations (PDEs).

MATH7302

Analytical Dynamics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Lagrangian and Hamiltonian Dynamics.

MATH7501

Probability and Statistics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The aim of the course is to introduce students to the theory of probability and some of the statistical methods based upon it.

MATH7601

Computational Methods

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A course on programming in Fortran.

LEVEL 3 COURSES

MATH3101

Measure Theory

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides the essential foundations of measure theory and theory of the integral.

MATH3103

Functional Analysis

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A course on Banach spaces in which the basic results of Banach space theory will be presented, as well as some abstract analysis.

MATH3105

Probability

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Following on from previous understanding of real analysis and measure theory, this course describes the rigorous theory of probability.

MATH3109

Multivariable Analysis

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course develops rigorously the important notions and theorems of analysis in R^n.

MATH3201

Commutative Algebra

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course on rings and modules and their application.

MATH3202

Galois Theory

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A course on Galois theory, bringing together ideas from group theory, ring theory and linear algebra.

MATH3203

Algebraic Topology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The purpose of this course is to provide an elementary introduction to the methods of Algebraic and Geometric Topology via the homology of simplicial complexes.

MATH3206

Lie Groups and Lie Algebras

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Lie groups are ubiquitous and appear in diverse applications; this course will teach lie groups by means of examples, starting with lie groups in two and three dimensions.

MATH3301

Real Fluids

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course on the flow of incompressible viscous fluids.

MATH3304

Geophysical Fluid Dynamics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course uses mathematics to discuss the global environment including the greenhouse effect, dispersion of pollutants along coasts, and the El Niño oscillation.

MATH3305

Mathematics for General Relativity

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course on Einstein's theory of special and general relativity.

MATH3307

Biomathematics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Covers the mathematical modelling of biological systems.

MATH3308

Maxwell's Theory of Electrodynamics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Covers the physics represented by Maxwell's equations and special relativity in the context of electromagnetism.

MATH3401

Mathematical Methods 5

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course on asymptotic methods.

MATH3402

Waves and Wave Scattering

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to linear and non-linear wave theory and the approximate methods used to tackle transmission and scattering in inhomogeneous media.

MATH3501

Theory of Traffic Flow I

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the mathematical modelling of traffic flow.

MATH3502

Combinatorial Optimisation

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course in combinatorial optimisation introduces the theory of efficiency of algorithms.

MATH3503

Graph Theory and Combinatorics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Covering graph theory, sets and Ramsey theory, this course aims to introduce students to discrete mathematics, which has many applications in computer science and related areas.

MATH3504

Mathematics in Economics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Applications of convexity to economics.

MATH3506

Mathematical Ecology

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Mathematical models in population biology.

MATH3508

Financial Mathematics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course is concerned with the valuation (i.e. pricing) of 'financial derivatives' which is an exciting and relatively new area of mathematical application.

MATH3509

Dynamical Systems

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Dynamical systems with examples, solutions, orbits, limit sets and stability.

MATH3601

Introduction to Mathematica

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces the Mathematica system, a high-level computing environment including computer algebra, graphics and programming.

MATH3603

Numerical Methods

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces numerical analysis, the theory underlying the numerical methods that are frequently used to solve a wide range of practical problems.

MATH3701

Theory of Numbers I

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Elementary number theory and applications.

MATH3703

Prime Numbers and Their Distribution

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Analytic number theory applies the methods of classical analysis to the integers and, in particular, to the properties of prime numbers.

continues

MATH3704

Algebraic Number Theory

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Applications of Algebra to Number Theory.

MATH3705

Elliptic Curves

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

After an introduction to elliptic curves over a general field, describing their group law and their normal forms, the course progresses to more advanced study.

MATH3801

Logic

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Formal mathematical logic and Gödel's theorems.

MATH3802

History of Mathematics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Mathematical thought from early times to 1800AD.

MATH7102

Analysis 4: Real Analysis

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Analysis in several variables, Metric spaces.

MATH7202

Algebra 4: Groups and Rings

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A course on group classification and rings.

MATH7402

Mathematical Methods 4

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Special functions and transforms in the solution of Partial Differential Equations.

LEVEL 4 COURSES

MATHM111

Spectral Theory

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Spectral theory came to prominence when quantum mechanics was introduced in modern physics, in which classical quantities (position, momentum, etc.) are represented by operators.

MATHM112

Geometric Measure Theory

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The interplay between measure and geometry has given rise to powerful ideas used in, for example, energy minimisation problems and study of fractal geometry.

MATHM113

Differential Geometry and Topology

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Modern Geometry was born when Riemann first separated the concept of geometry from the concept of space (for this course the notion of a surface).

MATHM204

Representation Theory

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A study of representation theory of finite groups, within the general theory of symmetry.

MATHM211

Algebraic Geometry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Algebraic geometry of curves, including examples.

MATHM302

Asymptotic Methods and Boundary Layer Theory

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A continuation of MATH3301 (Real Fluids) concentrating on the high Reynolds number limit, interpreting boundary-layer theory as the leading term of a rational approximation to the Navier-Stokes equations.

MATHM306

Cosmology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Cosmology is the study of the history and structure of the universe.

MATHM505

Evolutionary Games and Population Genetics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Presents the fundamentals of Mathematical Population Genetics, which gives mathematical expression to the genetic aspects of evolution in natural populations.

MATHM803

History of 19th Century Geometry

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course discusses projective and non-Euclidean geometry and how they came to be accepted, and introduces a historical dimension as a way of thinking about mathematics.

MATHMM01

Advanced Modelling Mathematical Techniques

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Concepts, analytic techniques and computation for modelling a range of problems.

MATHMM21

Quantitative and Computational Finance

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A course in applied mathematical finance, derivative pricing and the application of PDEs to option pricing.

PHYSICS AND ASTRONOMY

The opportunity to study as an affiliate at UCL, sited in central London, in a Physics and Astronomy department highly rated for both teaching and research, is one which is not easily ignored.

Why study Physics and Astronomy at UCL?

UCL's Physics and Astronomy Department has a strong commitment to teaching and research and is highly rated worldwide. Teaching facilities are top class for both physics and astronomy, the latter using our very well equipped Observatory sited at Mill Hill in North London. Many of the teachers you will encounter are working at the forefront of their chosen research fields.

What you will gain from study at UCL

Our courses will help you to develop new skills in Physics or Astronomy and in some courses you will experience interaction with other disciplines such as Earth science and space science. For the more advanced student, project work can be undertaken and that can allow you to work with a supervisor from one of our top-rated research groups.

Teaching and Assessment

We teach by lectures, problem class/discussion and laboratory class as appropriate to the course. Assessment is by coursework and end-of-year examination, but with no examination for laboratory courses. For Fall Term-only students, alternative assessment will be arranged.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

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Dr Ian Furniss
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TEL +44 (0)20 7679 3481

Availability

Year
Fall Term
Spring Term

Tuition Fees

£18,500 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Earth Sciences, page 111
- Mathematics, page 113

LEVEL 1 COURSES

PHAS1102

Physics of the Universe

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an introduction to modern ideas in physics and astronomy.

PHAS1130

Practical Skills 1A

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Gives practice in astronomical experimental technique including data recording, data analysis and report writing; also provides an introduction to computer packaged analysis tools.

PHAS1224

Waves, Optics and Acoustics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The study of wave motion, covering both general features of the wave equation and features specific to electromagnetic waves and sound waves.

PHAS1228

Thermal Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course aims to develop, via a discussion of heat and the interaction of heat with matter, an understanding of the laws of thermodynamics.

PHAS1240

Practical Skills 1C

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A course giving an introduction to physics laboratory techniques and practice, and developing the basic practical skills necessary for performing experimental work.

PHAS1241

Practical Skills 1P

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course gives further instruction in experimental physics through a selection of scripted experimental exercises following on from PHAS1240.

PHAS1245

Mathematical Methods 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

All the mathematics required for the understanding of Level 1 Astronomy and Physics courses will be provided in this service course and PHAS1246.

PHAS1246

Mathematical Methods 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

All the mathematics required for the understanding of Level 1 Astronomy and Physics courses will be provided in this service course and PHAS1245.

continues

PHAS1247

Classical Mechanics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introductory course which starting from Newton's Law of Motion covers the techniques used to apply the laws to the solution of physical problems.

PHAS1449

Practical Mathematics 1

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course will provide a foundation in computer-based mathematical modelling for students of Theoretical Physics.

LEVEL 2 COURSES

PHAS2112

Astrophysical Processes: Nebulae to Stars

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The aim of this course is to introduce students to the most important astrophysical processes encountered in a wide range of nebular and stellar environments.

PHAS2117

Physics of the Solar System

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The basic requirements, central principles, and practical considerations for components used in complete astronomical data-acquisition systems in different wavebands in the electromagnetic spectrum.

PHAS2130

Practical Astrophysics 2A

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the basic specialist skills required by the practicing astrophysicist through a set of experiments in laboratory astrophysics including an introduction to Mathematica.

PHAS2201

Electricity and Magnetism

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A foundation course in electricity and magnetism providing the basis for more advanced courses plus essential techniques for use in other areas of physics.

PHAS2222

Quantum Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introductory course in quantum mechanics covering the failure of classical Newtonian mechanics and the basics of quantum mechanics motivated by physical examples.

PHAS2224

Atomic and Molecular Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces the physics of atoms and molecules which has established the quantised nature of physical phenomena.

PHAS2228

Statistical Thermodynamics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course provides a foundation to an understanding of statistical thermodynamics required for the study of processes at the microscopic level and of solid-state physics.

PHAS2246

Mathematical Methods 3

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

In conjunction with PHAS1245 and PHAS1246, this course will provide the necessary mathematical underpinning for all core Physics and Astronomy modules.

PHAS2423

Mathematical Methods for Theoretical Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course will provide an introduction to Cartesian Tensors along with the mathematics of inhomogeneous equations and intergral transforms used in solving Fluid Mechanics problems.

PHAS2440

Practical Physics 2A

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the basic specialist skills required of the practicing physicist by means of experiments in Physics including an introduction to Numerical Methods.

PHAS2441

Practical Physics 2B

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Provides instruction in some of the more advanced specialist skills required of a practicing physicist and an opportunity to use the skills acquired in project work.

PHAS2443

Practical Mathematics 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The Mathematica component of this module equips students with the ability to analyse and solve problems of mathematical physics within a modern computing environment.

LEVEL 3 COURSES

PHAS3135
The Physics of Stars

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Theory of radiative transfer and structure of stellar atmospheres and interiors; use of these to understand the formation, evolution and death of stars.

PHAS3137
Physical Cosmology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course provides an introduction to basic cosmological principles and a summary of selected topics in extragalactic astronomy.

PHAS3201
Electromagnetic Theory

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Establishes Maxwell's equations of electromagnetism and uses them to derive electromagnetic wave equations and an understanding of e-m wave propagation in different media.

PHAS3224
Nuclear and Particle Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Introduces the nature of nuclei and particles, outlines their systematics and explores the nature of the forces between them.

PHAS3225
Solid State Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Gives an insight into the principles of the structure of solids, and understanding of the relationship between structure and thermal, mechanical, electronic and magnetic properties.

PHAS3226
Quantum Mechanics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Building on prior introductory study in Quantum Mechanics, this course aims to extend your knowledge and give a deeper understanding of the subject.

PHAS3330
Practical Astronomy 1 – Technique

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

The course will help develop competence in planning a set of astronomical observations, using large telescopes, CCD detectors and spectroscopy, and applying data reduction techniques.

PHAS3331
Practical Astronomy 2 – Applications

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Develops competence in the application of data reduction techniques to astrophysical datasets and in the analysis of such reduced sets to derive astrophysical relevant information.

PHAS3333
Interstellar Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Introduces the basic physics of the interstellar gas in its diffuse, ionised, and molecular phases, together with the properties of interstellar dust.

PHAS3338
Astronomical Spectroscopy

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This is a course developing an understanding of the spectra of atoms and molecules and their uses in astronomy.

PHAS3400
Physics Project – BSc

Availability	Year, Fall Term, Spring Term
Credit Value	4/8 (US) 7.5/15 (ECTS)

This is a full unit project which introduces the student to the world of research projects.

PHAS3424
Theory of Dynamical Systems

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the modern theory of dynamical systems with applications in Physics and their relevance to modelling mechanical and physical systems.

PHAS3427
Climate and Energy

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the science of climate change, the physics of energy generation and the possibility of intervening in the Earth's climate.

PHAS3440
Experimental Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

The aim of this module is to introduce advanced experimentation in Physics and statistical analysis of data.

PHAS3441
Group Project

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Aims to teach students how to function effectively in a group, simulating a professional working environment, tackling a problem in physics requiring group co-operation for its solutions.

PHAS3443
Lasers and Modern Optics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Gives an introduction to modern optics and laser physics introducing the principles and how they are applied to different physical processes.

PHAS3447
Materials and Nanomaterials

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the physics of materials science, addressing the mechanical, electrical, magnetic and optical properties of manufactured materials, and their exploitation in commercial devices.

continues

PHAS3459

Scientific Computing using Object Oriented Languages

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an introduction to the use of object oriented (OO) programming in the context of physics data handling and analysis using the Java language.

PHAS3661

Physics of the Earth

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course has emphasis on the new insights provided by modern techniques for determining properties of the Earth as a planet.

LEVEL 4 COURSES

PHASM312

Planetary Atmospheres

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Compares the atmospheres of all the planets and examines the past, present and future of the Earth's atmosphere with the perspective offered by the comparison.

PHASM314

Solar Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Presents a detailed description of the structure and behaviour of the Sun and its atmosphere aiming to provide a good understanding of the underlying physical processes.

PHASM315

High Energy Astrophysics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an understanding of the theoretical processes responsible for a range of high-energy stellar and galactic sources, using observational data from Earth satellites.

PHASM317

Galaxy and Cluster Dynamics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an in-depth study of the dynamical structure and evolution of galaxies, clusters within galaxies, and clusters of galaxies and how they have obtained their observed characteristics.

PHASM336

Advanced Physical Cosmology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

To provide an advanced level exposition of modern theoretical and observational cosmology. (Tensor mathematics as applied to general relativity is required.)

PHASM421

Atom and Photon Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Introduces the interactions of photons with atoms, discussing in particular the operation and use of lasers and the role of lasers in modern spectroscopic techniques.

PHASM426

Advanced Quantum Theory

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Extends perturbation theory to time-dependent systems and gives an introduction to a quantum mechanical description of the scattering of low-energy particles by a potential.

PHASM427

Quantum Computation and Communication

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Introduction to the field of quantum information covering the basic notions of quantum cryptography, quantum algorithms, teleportation, as well as state-of-the-art experiments.

PHASM431

Molecular Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The course aims to introduce advanced students to a detailed discussion of the spectroscopy and electronic states of polyatomic molecules.

PHASM442

Particle Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Covers the basic concepts of particle physics, including the fundamental interactions and particles and the role of symmetries.

PHASM465

Space Plasma and Magnetospheric Physics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Introduces the solar wind and its interaction with various bodies in the solar system, in particular the Earth and the environment in which most spacecraft operate.

PHASM472

Order and Excitations in Condensed Matter

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Provides a unified description of order and excitations in condensed matter with an emphasis on how they may be determined with modern x-ray and neutron techniques.

PHASM800

Molecular Biophysics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an insight into the molecular machinery of biological cells. Concepts will be introduced through studying biomolecular structure, DNA packing in the genome, molecular motors and neural signalling.

SCIENCE AND TECHNOLOGY STUDIES

Science and Technology Studies (STS) at UCL offers a unique array of interdisciplinary subjects concerning science, technology and medicine addressing their history, philosophy and sociology, as well as science policy, science communication, and science in the mass media and art.

Why study Science and Technology Studies at UCL?

UCL was a pioneer in the UK in offering Science and Technology Studies at undergraduate level. We combine historical and philosophical studies of science with approaches from the social sciences, including the sociology of knowledge and communication studies. To further our interests in contemporary issues we have strong links with government and the media in London, as well as with non-governmental organisations, learned societies and activist groups. Our students learn with world-class teachers and researchers, and can reflect on their studies in the theatres, museums and parks of our great city.

What will you gain from study at UCL?

We welcome students from both humanities and sciences backgrounds, and affiliate students coming from diverse academic backgrounds can expect to find the truly interdisciplinary nature of our research expertise especially relevant.

Teaching and Assessment

Each course consists of an average of 20 lectures and tutorials per term. Assessment methods vary and can include assignments, examinations and presentations. Fall Term only students will be offered alternative assessment if their examination is set in the Summer Term.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

Dr Simon Lock
EMAIL simon.lock@ucl.ac.uk
TEL +44 (0)20 7679 3763

Availability

Year
Fall Term
Spring Term

Tuition Fees

£14,000 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Philosophy, page 52
- Biological Sciences, page 99
- Chemistry, page 109
- Physics, page 117
- Science and Technology Studies – Global Citizenship programme, page 124
- Geography, page 151
- History, page 154

LEVEL 1 COURSES

HPSC1001
History of Science

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course provides a survey of the origins and development of science from the Ancient Greeks to 1800.

HPSC1003
Philosophy of Science

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This is an introductory course in the philosophy of science with a focus on several central problems regarding the nature of scientific knowledge.

HPSC1004
Introduction to Science Policy Studies

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to social and political thinking about the role of science and technology in society and the relationship between science and the state.

HPSC1008
Introduction to Science Communication

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces the public dimension of science and technology, exploring the relationship between professional science and the news media, science fiction, activism, advertising and museums.

HPSC1010
Science in the Spotlight

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to history, philosophy, and social studies of science, focusing on classic and contemporary case studies.

HPSC1011
History of Modern Science

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Explores the sciences from 1850 to the present, in their social, political and cultural contexts, with an emphasis on the 20th century.

LEVEL 2 COURSES

HPSC2001
Policy Issues in the Life Sciences

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides a critical overview of policy issues arising from developments in the biological sciences, including, for example, medical research policy, biological weapons research and animal experimentation.

HPSC2002
Science in the Mass Media

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to media studies for those interested in relations between science and the media.

continues

HPSC2003

Topics in Philosophy of Science

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A continuation of HPSC1003, exploring realism and antirealism about scientific theories; scientific explanation; and laws of nature.

HPSC2012

Science, Religion and Revolution

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Examines the relations between science, religion and progress, considering the ancient world, Islam, China, and the role of Christianity in the scientific revolution of the 17th century.

HPSC2018

History of Life Sciences

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A historical survey of the biological sciences from the Enlightenment to the present, including scientific theories, methods and people.

HPSC2019

History of Modern Physical Science

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the history of 19th and 20th century physics, including a survey of the philosophical and conceptual issues arising from relativity and electromagnetism among others.

HPSC2020

Revolutions in Medicine

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course considers whether Kuhn's views on scientific revolutions – which were developed mainly in relation to astronomy, physics and chemistry – apply to medicine.

HPSC2022

Philosophy of Social Science

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

How does the 'science' practised by social scientists compare with the 'science' practised by biological, physical and medical scientists? This course examines such fundamental questions about the social sciences.

HPSC2023

Sociology of Science and Technology

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to and overview of the sociology of science and the sociology of technology, examining the different ways in which technology is shaped by social factors.

Courses from the Science and Technology Studies: Global Citizenship programme **(see pages 122-123)**

HPSC2014

Science and Global Citizenship

Availability	Spring Term

HPSC2016

Science, Communication and The Global Community

Availability	Fall Term

HPSC2017

Action for Global Citizenship

Availability	Spring Term, Fall Term

HPSC3030

Science and Global History

Availability	Spring Term

LEVEL 3 COURSES

HPSC3002

Science, Warfare, and Peace

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Explores the role of science and scientists in military applications, in wartime, and in peace.

HPSC3003

Communication of Scientific Ideas

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

A practical course in communicating science, based around three key tasks. Issues in the public understanding of science are discussed from this practical standpoint of communication.

HPSC3004

Dissertation

Availability	Year
Credit Value	4 (US) 7.5 (ECTS)

Students undertake a research project of their own design in the field of science and technology studies, working under academic supervision, and resulting in a dissertation.

HPSC3006

Advanced Sociology of Science

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Examines the complex relationship between science and society and takes a sociological look at the process by which knowledge is constructed through historical and contemporary studies.

HPSC3007

Topics in the History of the Physical Sciences

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

The purpose of this course is to provide training in reading primary sources and in the understanding of past conceptual structures.

HPSC3015

History of Astronomy and Cosmology

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Charts our changing conception of the universe from the ancient world to the current day.

HPSC3020

Philosophy of Physics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

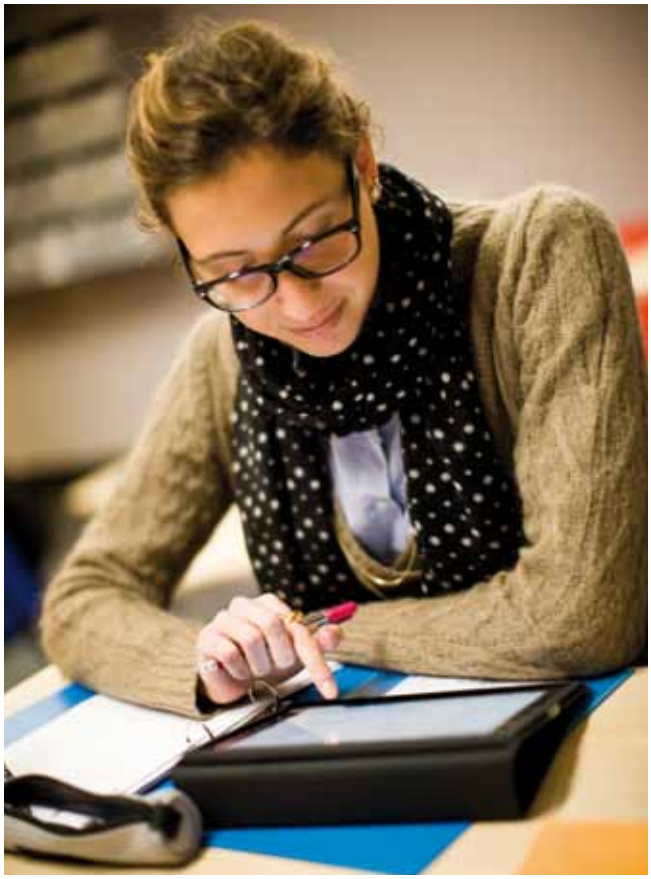
This advanced course aims to explore the relationship between philosophy and physics, with a focus on selected issues in the history and philosophy of modern physics.

HPSC3022

Special Topics in Science and Technology Studies: Science, Art and Philosophy

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Explores the interaction between science and art from the mid-19th century to the present. Its focus is the notion of 'representation' conceived as a crucial common link between scientific and visual artistic practices.



HPSC3027

Evolution in Science and Culture

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A historical survey of evolutionary thinking from the Enlightenment to the present, including the history of scientific ideas and the influence of evolutionary ideas on society.

HPSC3028

Observation and Discovery in Medicine

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Aims to explain some of the basic ideas of philosophy of science and how they relate to medicine.

HPSC3029

Medicine, Disease and History

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course addresses the changes and developments in Western medicine from the Ancient Greek world to 1700.

HPSC3032

Investigating Contemporary Science

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Students will use and develop their existing skills to investigate deeply, assess and present their findings on a chosen issue in the comtemporary politics of science.

SCIENCE AND TECHNOLOGY STUDIES – GLOBAL CITIZENSHIP PROGRAMME

The STS Global Citizenship Programme draws on UCL's expertise in science studies, history, politics, media studies, sociology and anthropology, to enable you to understand citizenship both as a significant intellectual concern of our time, and as a programme of action that will empower you to make changes for a better world.

Why study on the Science and Technology Studies – Global Citizenship Programme at UCL?

This programme is designed to allow you to draw on, and work with, many experts and professional institutions engaged in science and citizenship issues across UCL, and the vibrant capital city of London itself.

What you will gain from study at UCL

Your courses, including some compulsory elements, have been designed to equip you with a critical and practical sense of what it means to be a global citizen in the 21st century. These will mainly be taught in Science and Technology Studies, a department with a strong record of interdisciplinary research and teaching. You will complement these by selecting courses, taught in UCL's other departments, from a prescribed list.

Teaching and Assessment

Teaching will be in lectures and seminars. Assessment is by examination and coursework. Alternative assessment is available for students not attending for the full year.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

Dr Simon Lock
EMAIL global-citizen@ucl.ac.uk
TEL +44 (0)20 7679 3763

Availability

Year
Fall Term
Spring Term

Tuition Fees

£14,000 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Biological Sciences, page 99
- Anthropology, page 141
- Geography, page 151
- History, page 154
- Political Science, page 163

LEVEL 2 COURSES

HPSC2014

Science and Global Citizenship

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Does the internet create a more global and democratic society? What are our obligations as global citizens? This course explores such questions, with special reference to global climate change and the internet.

HPSC2016

Science, Communication and the Global Community

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Explores the scientific community and the public sphere on a global scale, examining the development of globalised phenomena such as media networks, epidemics and scientific research.

HPSC2017

Action for Global Citizenship

Availability	Fall Term, Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This is an action-based group-work course in which students develop and implement a project on a contemporary issue via which they enhance their own citizenship.

LEVEL 3 COURSES

HPSC3030

Science and Global History

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Explores the history of medieval Islamic and western Christian science from a comparative perspective and focuses on the transfer of knowledge from the Ancient Greek world to the Arabic and then the Latin West.

Full-year students on the Global Citizenship programme must take the Action for Global Citizenship course, and at least two further courses from within the Global Citizenship provision. They may then choose one course from those offered across the whole of UCL, and make up the remainder of their credits from other Global Citizenship courses, or from courses in other UCL departments included in the prescribed list below. Fall Term or Spring/ Summer Term students will take half the number of credits made up from those courses running in the terms attended.

COURSES

For course descriptions see listings under home departments.

Arts and Humanities

PHIL1016
Introduction to Political Philosophy

PHIL2032
Applied Ethics

PHIL3031
Global Justice and Health

Mathematical and Physical Sciences

GEOL1003
History of Life

HPSC1001
History of Science

HPSC1004
Introduction to Science Policy Studies

HSPC1010
Science in the Spotlight

HSPC1011
History of Modern Science

HPSC2001
Policy Issues in the Life Sciences

HPSC2002
Science in the Mass Media

HPSC2023
Sociology of Science and Technology

HPSC3002
Science, Warfare and Peace

HPSC3032
Investigating Contemporary Science

Social and Historical Sciences

ECON1005
The World Economy

ECON1006
History of Economic Thought

GEOG1007
Global Geographies

GEOG2014
Development Geography

GEOG2019
Political Geography and Geopolitics

HIST1001
From the Ancient Near East to the 21st Century

HIST6001
The History of Political Thought

HIST6302
European History since 1945

HIST6314
The Making of Modern America: The United States since 1920

HIST6317
History and Theory of International Relations

POLS6001
Introduction to British Politics

POLS6004
Changing Britain's Constitution

POLS6005
International Security

POLS6006
Politics of the European Union

POLS6007
International Development and Public Policy

POLS6008
Gender and Politics

POLS6009
Global Environmental Politics

POLS6010
International Relations Theories

School of Slavonic and East European Studies

SESS2101
History of European Political Ideas

SESS2102
Politics and Society in Central and Eastern Europe

SESS2105
Democracy and Democratisation

STATISTICAL SCIENCE

Statistical Science is the essential logic of scientific research. In planning surveys and experiments, validly interpreting data, and producing estimates, forecasts and decisions, the advance of science relies on the principles of statistics and the art of the statistician.

Why study Statistical Science at UCL?

The department has played a major role in the development of statistical science ever since its foundation in 1911 as the Department of Applied Statistics – the first such department in the world. Its present staff continue to make important contributions. Their interests cover a wide spectrum, from the foundations of statistics to applications in finance, industry, science and medicine.

What you will gain from study at UCL

You will have the opportunity to study both theoretical and practical aspects of statistics. Theoretical concepts are illustrated by real-world examples and courses on the practical use of statistical software are offered. You may also pursue personal interests through advanced, specialist courses on the application of statistics in subjects such as medicine and finance.

Teaching and Assessment

Lectures are supplemented by tutorials, workshops or problem classes. Assessment is mostly by end-of-year examinations; thus we only accept students for the full year or Spring Term only. A few courses are assessed on project work.

Extended descriptions of the courses available can be found by visiting the web address at the top of this page

Contact Name

Statistical Science Affiliate Tutor
EMAIL
studyabroad@stats.ucl.ac.uk
TEL +44 (0)20 7679 1872

Availability

Year
Spring Term

Tuition Fees

£14,000 (for full explanation of tuition fees please see page 165)

Related courses can be found in these departments:

- Mathematics, page 113
- Economics, page 148

LEVEL 1 COURSES

STAT1004

Introduction to Probability and Statistics

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course provides an accessible and application-oriented introduction to basic ideas in probability and statistics.

STAT1005

Further Probability and Statistics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces a formal framework for the study of probability and statistics, building on the intuitive concepts introduced in STAT1004.

STAT1006

Introduction to Practical Statistics

Availability	Year
Credit Value	4 (US) 7.5 (ECTS)

The aim of this course is to provide training in the basic skills of practical statistics using a statistical software package.

LEVEL 2 COURSES

STAT2001

Probability and Inference

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Continues the study of probability and statistics beyond the basic concepts introduced in STAT1004, 1005 and 1006, covering formal concepts and methods in estimation.

STAT2002

Linear Models and the Analysis of Variance

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This courses provides an introduction to linear statistical modelling and to the analysis of variance with emphasis on ideas, methods, applications and interpretation of results.

STAT2003

Introduction to Applied Probability

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

An introduction to the study of systems that change state stochastically with time, plus development of skills in the application of probabilistic ideas.

STAT7001

Computing for Practical Statistics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Aims to extend students' practical experience of statistical packages, and to help them gain further understanding of ideas and methods already taught and experience of data analysis.

STAT7002

Social Statistics

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Covers basic mathematical aspects of sample survey design and analysis, practical considerations in carrying out a survey and some key concepts in measurement theory.

STAT7003

Optimisation Algorithms in Operational Research

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an introduction to the ideas underlying the optimal choice of component variables, possibly subject to constraints, that maximise (or minimise) an objective function.

LEVEL 3 COURSES

STAT3001

Statistical Inference

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course provides a grounding in the theoretical foundations of statistical inference and, in particular, introduces the theory underlying statistical estimation and hypothesis testing.

STAT3002

Stochastic Systems

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

Continues the study of random processes started in STAT2003. The emphasis is now on Operational Research applications, queueing theory, renewal and semi-Markov and reliability theory.

STAT3003

Forecasting

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces methods of finding and extrapolating patterns in time-ordered sequences.

STAT3004

Decision and Risk

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course provides an introduction to the ideas underlying the calculation of risk and the structure of rational, consistent decision making.

STAT3005

Factorial Experimentation

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces 2k experiments, fractions, blocking and designs for response surface modelling. Experimental designs to achieve quality control, including Taguchi ideas, will be discussed.

STAT3006

Stochastic Methods in Finance

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

This course introduces mathematical concepts and tools used in the finance industry, in particular stochastic models and techniques used for financial modelling and derivative pricing.

STAT3008

Medical Statistics 1

Availability	Fall Term
Credit Value	4 (US) 7.5 (ECTS)

Provides an introduction to the fields of clinical trials and epidemiology, with emphasis on the statistical ideas and methodology most widely used in these areas.

STAT3009

Medical Statistics 2

Availability	Spring Term
Credit Value	4 (US) 7.5 (ECTS)

A continuation of the study of medical statistics started in STAT3008, with emphasis on more advanced topics in epidemiological methods and the design and analysis of clinical trials.