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Welcome to the College

Congratulations on joining Imperial College London, the only university in the UK to focus exclusively on science, medicine, engineering and business.

From Fleming’s discovery of Penicillin to Gabor’s invention of holography, Imperial has been changing the world for well over 100 years. You’re now part of this prestigious community of discovery and we hope you will take this opportunity to make your own unique contribution.

We’re committed to providing you with the very best academic resources to enrich your experience. We also provide a dedicated support network and a range of specialist support services to make sure you have access to the appropriate help, whether that's further training in an academic skill like note taking or simply having someone to talk to.

You’ll have access to an innovative range of professional development courses within our Graduate School throughout your time here, as well as opportunities to meet students from across the College at academic and social events – see page 6 for more information.

We actively encourage you to seek out help when you need it and try to maintain a healthy work-life balance. Our choice of over 340 clubs, societies and projects is one of the largest of any UK university, making it easy to do something different with your downtime. You also have free access to gym (following a one-off orientation fee of £40 in 2016) and swimming facilities across our campuses.

As one of the best universities in the world, we are committed to inspiring the next generation of scientists, engineers, clinicians and business leaders by continuing to share the wonder of what we do through public engagement events. Postgraduate students, alongside our academics and undergraduate students, make a significant contribution to events such as our annual Imperial Festival and our term-time Imperial Fringe events – if you’re interested in getting involved then there will be opportunities for you to do so.
Welcome
Professor Sue Gibson,
Director of the Graduate School

The Graduate School has several roles but our main functions are to provide a broad, effective and innovative range of professional skills development courses and to facilitate interdisciplinary interactions by providing opportunities for students to meet at academic and social events. Whether you wish to pursue a career in academia, industry or something else, professional skills development training will improve your personal impact and will help you to become a productive and successful researcher.

Professional skills courses for Master’s students are called “Masterclasses” and they cover a range of themes, for example, presentation skills, academic writing and leadership skills (see page 6 for more information).

All Masterclasses are free of charge to Imperial Master’s students and I would encourage you to take as many as you can to supplement your academic training. The Graduate School works closely with the Graduate Students’ Union (GSU) and is keen to respond to student needs, so if there is an area of skills training or an activity that you would like us to offer, but which is not currently provided, please do get in touch (see page 6).

The Graduate School also runs a number of exciting social events throughout the year which are an opportunity to broaden your knowledge as well as to meet other students and have fun. Particular highlights include the Ig Nobel Awards Tour Show, the Chemistry Show and the 3-minute thesis competition. You should regularly check the Graduate School’s website and e-newsletters to keep up to date with all the events and training courses available to you.

Finally, I hope that you enjoy your studies here at Imperial, and I wish you well.

Welcome
Dr Janet De Wilde,
Head of Postgraduate Professional Development

I would like to welcome you to the Graduate School programme for postgraduate professional development. Our team of tutors come from a wide variety of experiences and we understand just how important it is to develop professional skills whilst undertaking postgraduate studies and research. Not only will this development improve your success during your time at Imperial, it will also prepare you for your future careers. We are continually working to develop the courses we offer and over this year you will see a range of new courses including face-to-face workshops, interactive webinars and online self-paced courses. I encourage you to explore and engage with the diverse range of opportunities on offer from the graduate school and I wish you well in your studies.
The Graduate School

You automatically become a member of the Graduate School when you register as a postgraduate student at Imperial.

The Graduate School has been set up to support all postgraduate students at the College through:

- Training and development courses
- Networking activities, social and academic events to encourage cross-disciplinary interactions
- Forums to represent the views of postgraduate students throughout the College

‘Masterclass’ professional skills courses

You can see the full range of free professional skills courses for postgraduate students on the Graduate School website:

[www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters](http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters)

All courses can be booked online.

Contact us

- Level 3, Sherfield Building, South Kensington Campus
- 020 7594 1383
- graduate.school@imperial.ac.uk
- [www.imperial.ac.uk/graduate-school](http://www.imperial.ac.uk/graduate-school)

Imperial Success Guide

The Imperial Success Guide is an online resource with advice and tips on the transition to Master’s level study. More than just a study guide, it is packed with advice created especially for Imperial Master’s students, including information on support, health and well-being and ideas to help you make the most of London.

[www.imperial.ac.uk/success-guide](http://www.imperial.ac.uk/success-guide)
Introduction from the President of the Graduate Students’ Union

I am delighted to welcome you to Imperial, and to the Graduate Students’ Union (GSU). I hope that your time here will be fulfilling and valuable, and the GSU is here to try and facilitate this.

Imperial College London is such a wonderful and transformative place that provides a unique and thrilling environment for research and for advanced studies, and the graduate students are a vital and valued part of the wider community of Imperial. Our graduate students are at the forefront of the research done. Therefore, at the GSU we ensure that the experience here fosters both academic achievement and personal development in our students.

The GSU is a University-wide representative body for postgraduate students at Imperial. It promotes the interests and welfare of its members, provides social and recreational activities and advocate for you and your opinions to the University and bodies external to the university. I encourage you to become an active member of the GSU—through involvement in your departments and the many University societies, and through our representational and campaigning activities.

I wish you all a fantastic time here at Imperial. Please take advantage of our rich community, and hope to meet you all soon.

Ahmed Shamso

gsu.president@imperial.ac.uk
1. Introduction to the Department

Welcome from the Head of Department

Dear Colleague,

Welcome to the Department of Mathematics at Imperial College.

I hope that your time here as a postgraduate student is both productive and fruitful.

Best wishes with your studies.

Prof Richard Craster

Welcome from the Director of Postgraduate Studies

Dear New MSc Students,

Welcome to the Mathematics Department at Imperial. The Department is eager to help you make your year of study a satisfying period of learning and creativity.

Please read on. Your success and comfort will depend on your familiarity with the essentials of being an MSc student. I know you may experience a degree of information overload initially. But read at least this page and keep the welcome pack within reach for reference.

(1) Engage: Mathematics and science are social activities. Your fellow students across the department and throughout the college are wonderful resources of help, friendship, inspiration and creative stimulation, so get involved.

(2) Academic and administrative support: The intention is that you develop a constructive, and hopefully friendly and fulfilling, relationship with the lecturers of the courses and your project supervisor.

(3) Depth and breadth: Good mathematics and science needs the right balance between depth and breadth. One inevitably needs a thorough knowledge of ideas, methods and techniques from as broad a field as practically possible. Through breadth one may become aware of existing approaches that can turn out to be helpful when working on specific problems. Breadth is also needed in order to know what today's interesting and important open problems are. On the other hand, depth is needed to ensure that one's level of understanding is sufficiently detailed to allow one to make creative contributions.

During your MSc study it is a good idea to attend seminars and the department colloquia, participate in discussion groups, etc. and in general feed your curiosity.

I sincerely wish the next year may lead you to the insights and achievements you are hoping for,

Prof Henrik Jeldtoft Jensen
Welcome from the Programme Director

Welcome to the MSc in Mathematics and Finance in the Department of Mathematics, Imperial College London. We hope you will enjoy studying here, and take profit from all the opportunities offered by the department and the College as a whole.

Mathematical finance is a subject that is both mathematically challenging and deployed every day by sophisticated practitioners in the financial markets. Our objective is to provide you with everything you need in order to get into this area at a level where you can understand – and contribute to – the latest research in this area.

To achieve this, we have designed a full-year course, consisting of lectures and a research project. Through the modules offered during the year, you will learn the mathematical tools used on financial markets and become aware and critical of current practices in the financial industry at large: some modules concentrate on finance and economics background, including notions of arbitrage and risk management, while others provide training in fundamental mathematics (stochastic analysis, partial differential equations); several modules, statistics, numerical methods, (C++) programming will allow you to test the mathematical theory against real data, and a range of elective modules to choose from will give you the opportunity to specialise yourself on some specific areas of mathematical finance.

The final part of the curriculum is devoted to a research project which culminates in a MSc thesis.

In addition, a certain number of modules are offered by the College, covering a range of transferable skills such as presentation, academic writing and negotiation skills.

This booklet provides an overview of the programme structure. We encourage you to read it carefully and to keep it for future reference.
## Academic and administrative staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Location</th>
<th>Phone Number</th>
<th>Email Address</th>
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<tbody>
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English language requirement

If you are not a native English speaker you must meet the College’s English language requirements.

See the Admissions website for details:

www.imperial.ac.uk/study/pg/apply/requirements/english

For information on English language support available while you’re here, see page 41.

Attendance and absence

You must inform your Course Adviser if you are absent from the College for more than three days during term. If the absence is due to illness you must produce a medical certificate after seven days. If you miss an examination through illness you must produce a medical certificate immediately.

The Registry will be informed of all student non-attendances as the College is obliged to report the non-attendance of students on Tier 4 visas to the Home Office.
Key dates 2016–17

Term dates
Autumn term: 1 October–16 December 2016
Spring term: 7 January–24 March 2017
Summer term: 29 April–30 June 2017

Closure dates
Christmas/New year: 26 December 2016–2 January 2017
Easter holiday: 12 April – 18 April 2017
Early May bank holiday: 1 May 2017
Spring bank holiday: 29 May 2017
Summer bank holiday: 28 August 2017

Key events
Monday 3- Friday 7 October 2016: Welcome week programme
Election of the Maths and Finance MSc student representative

Monday 9 –13 January 2017: Examinations autumn term
Mid-February 2017: Release informal results January Examinations

May 2017: Examinations Spring term
May 2017: Project work commences
Mid June 2017: Release informal results Spring Examinations

Tuesday 12 September 2017: Final deadline handing in MSc Thesis
Mid-late October 2017: Final meeting Board of Examiners
Early-mid November 2017: Release results by Registry
May 2018: Graduation Ceremony
2. Programme information

The Mathematical Finance Section

The Mathematical Finance Section is part of the Mathematics Department in Imperial College London. Every staff member in the Section has regular office hours, which will be made available at the beginning of his lectures, or on his webpage.

The Mathematical Finance group in Imperial College London is one of the largest in the world, and the research interests of its members (see below) span broad areas of the field. As a large group, a number of research-related activities are organised throughout the year, including seminars, conferences, colloquia, providing a view of cutting edge research in the area of mathematical finance and stochastic analysis. Most seminars and conferences are free to attend and registration may or may not be required. You are more than welcome, and in fact strongly encouraged, to attend some. Full details can be found on the section website www3.imperial.ac.uk/mathfin/pgprogrammes/msc.

Members of the Mathematical Finance Section and research interests

Dr Christopher Barnett (c.barnett@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/c.barnett  
Research Interests: vector integration theory, non-commutative probability, von Neumann algebras and von Neumann regular rings, mathematical finance.

Professor Nicholas Bingham (n.bingham@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/n.bingham  
Research Interests: limit theorems in probability, topological regular variation, stationary processes and prediction theory, Lévy and other models in mathematical finance.

Professor Damiano Brigo (damiano.brigo@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/damiano.brigo  
Research Interests: valuation and pricing, risk measurement, liquidity risk, credit and default modelling, counterparty risk, nonlinear valuation, differential geometric approach to statistics, stochastic differential geometry, nonlinear stochastic filtering.

Dr Thomas Cass (thomas.cass@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/thomas.cass  
Research Interests: Rough Paths, Gaussian processes, Malliavin calculus, McKean-Vlasov-type models for large populations of interacting agents, Stochastic differential geometry.

Dr Ilya Chevyrev (Postdoctoral Research Fellow, ilya.chevyrev@maths.ox.ac.uk)  
Research Interests: stochastic processes, rough paths.

Professor Rama Cont (r.cont@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/r.cont  
Research Interests: stochastic analysis, stochastic processes and mathematical modelling in finance, extreme market risks, discontinuities in market behaviour, endogenous risk, systemic risk.
Professor Mark Davis (mark.davis@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/mark.davis  
Research Interests: stochastic analysis and financial mathematics, credit risk models, pricing in incomplete markets and stochastic volatility.

Dr Giuseppe Di Graziano (Visiting Professor, g.di-graziano@imperial.ac.uk)  
Webpage: http://digraziano.co.uk/peppe1/Home.html  
Research Interests: algorithmic trading, pricing, commodities.

Dr Blanka Horvath (Postdoctoral Research Fellow, b.horvath@imperial.ac.uk)  
Webpage: https://www.imperial.ac.uk/people/b.horvath  
Research Interests: robust asymptotic and numerical methods for degenerate processes, asymptotic methods, heat kernel expansions, smile asymptotics for local and stochastic volatility models.

Dr Antoine Jacquier (a.jacquier@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/a.jacquier  
Research Interests: large deviations, asymptotic methods, volatility modelling.

Dr Richard Martin (Visiting Professor, richard.martin1@imperial.ac.uk)  
Webpage: https://uk.linkedin.com/in/richard-martin-3625467  
Research Interests: mathematical modelling of credit including fundamentals, derivatives and portfolios.

Dr Eyal Neumann (Postdoctoral Research Fellow, e.neumann@imperial.ac.uk)  
Research Interests: probability and stochastic processes, interacting particle systems, stochastic partial differential equations, mathematical finance.

Dr Mikko Pakkanen (m.pakkanen@imperial.ac.uk)  
Webpage: http://www.mikkopakkanen.fi/  
Research Interests: ambit stochastics, limit theorems in probability, market microstructure, limit order books, realised volatility, statistical inference, stochastic volatility.

Dr Andrea Pallavicini (Visiting Professor, a.pallavicini@imperial.ac.uk)  
Webpage: https://www.linkedin.com/in/andreapallavicini  
Research Interests: credit, interest-rate and equity derivatives, FX and commodity models.

Dr Martijn Pistorius (m.pistorius@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/m.pistorius  
Research Interests: dynamic risk-measures, stochastic optimal control, optimal stopping in insurance and finance, financial modelling, calibration and computational aspects.

Dr Pietro Siorpaes (p.siorpaes@imperial.ac.uk)  
Webpage: https://www.maths.ox.ac.uk/people/pietro.siorpaes  
Research Interests: mathematical finance, probability, general theory of processes, optimal investment, utility based pricing, stochastic calculus, mathematical finance.

Dr Harry Zheng (h.zheng@imperial.ac.uk)  
Webpage: http://www.imperial.ac.uk/people/h.zheng  
Research Interests: stochastic control, optimisation, financial mathematics.
Personal Tutors

Each student is assigned a personal tutor from the Mathematical Finance Section, with whom a meeting is arranged during the first week of term. The tutor is the first point of contact and offers advice regarding module selection and other matters as needed. Your personal tutor is likely to be one of the people you may ask later for reference letters; it is therefore advisable that he gets to know you, and you are encouraged to keep in touch with him while enrolled in the MSc and to keep him informed about any factors, such as illness, that may affect performance. Communication between a student and his/her personal tutor (and potentially the Course Director) is treated in full confidentiality. The personal tutor is not responsible for administrative issues, and for any such matter, Louise Rowland, the MSc Administrator, will be able to help you.

Should you have any difficulties contacting your personal tutor, you are strongly encouraged to contact the MSc Course Director, Dr Antoine Jacquier.

The MSc: inside and outside

BlackBoard

Most of the information you shall need during the year, from lecture notes, courseworks, past exams, to timetables and special events are available on Blackboard: https://bb.imperial.ac.uk. A calendar with all events and timetables can be found on your personal Blackboard.

The Alumni network

Part of the strength or the programme, apart from its academic contents, is its large network of alumni since its inception in 2000. The Imperial College Mathematics and Finance MSc Alumni Group is a LinkedIn group dedicated to alumni of the programme, and advertises job positions and events:

https://www.linkedin.com/groups/4807498

Several events will be organised throughout the year to allow you to expand your network. In particular, the annual MSc Alumni reception will take place, as usual, late November. More information will be given in due time.

Meeting with Practitioners

Compulsory weekly meetings with practitioners are organised, in order to familiarise yourself with the many sides of the financial industry, from hard-core quantitative research to hedge funds, risk management, regulators, software development,.... These meetings will also help you find a project for the end of the year. You are strongly encouraged to be proactive during those.
Programme Structure

To qualify for the degree of MSc in Mathematics and Finance, you must take examinations in ten modules, achieving a passing grade (50%) in at least eight of them, an overall average of at least 50%, and at least 40% in each examination. You must achieve a grade of at least 50% in the Project Thesis at the end of the year. The ten modules taken must include the eight core modules. The remaining two modules can be selected from the available electives.

Autumn Term 1 October–16 December 2016

Week 1 There are two special, non-assessed four-hour introductory short modules:

- **Mathematical Analysis** (Dr Barnett)
- **Statistical Methods** (Prof. Bingham)

Weeks 2-11

The following four core modules must be taken:

- **M5F22 Mathematical Finance: an Introduction to Option pricing** (Prof. Bingham)
- **M5MF3 Stochastic Processes** (Dr Cass)
- **M5MF10 Quantitative Risk Management** (Dr Pakkanen)
- **M5MF38 Statistical Methods in Finance** (Dr Pistorius)

Two elective modules are available in the Autumn term:

- **M5MF12 Algorithmic Trading and Machine Learning** (Dr Di Graziano/Dr Ramaswamy)
- **M5MF8 Fixed income markets** (Dr Martin)

One non-assessed computing module is available:

- **M5MF21 Computing in C** (Dr Nürnberg): *This module is not assessed but is a prerequisite for the C++ module in the Spring Term, and should therefore be taken if you are not already familiar with C.*

Spring Term 7 January–24 March 2017

Week 1 Examinations on the Autumn Term modules.

Weeks 2-11

You must take the following four core modules:

- **M5MF6 Advanced Methods in Derivative Pricing** (Dr Jacquier)
- **M5MF25 Computing in C++** (Dr Nürnberg)
- **M5MF30 Interest Rate Models with Credit Risk, Collateral, Funding Liquidity Risk and Multiple Curves** (Prof. Brigo)
- **M5MF4 Simulation Methods for Finance** (Dr Zheng)
In addition, the following elective modules are available:

- **M5MF2** Numerical Methods for Finance (Dr Jacquier)
- **M5MF46** Convex Analysis and Optimization (Dr Siorpaes)
- **M5MF32** Lévy Processes: Theory and Applications (Dr Pistorius)
- **M5MF35** Dynamic Portfolio Theory (Dr Zheng)
- **M5MF47** Stochastic Differential Equations (Dr Cass)

You may also choose the following elective (half-unit) modules. They count as one full elective and must be taken together. They have only a limited number of places:

- **M5MS11** Statistics for Extreme Events (Dr Noven)
- **M5MS12** Financial Econometrics (Dr Pakkanen)

**Summer Term 29 April–30 September 2017**

**Weeks 1-2** Examinations of the Spring Term modules.

**Weeks 3-9** Project work begins.

Thesis submission deadline: no later than **16:00, Tuesday 12 September 2017**.

**Notes:**

1. You are entitled to attend any module, whether or not you take the examination. You must take the examinations in all core modules and in at least two, and at most three, elective modules. Before the end of each term you will be asked to complete a form stating what examinations you plan to take.

2. Examination arrangements vary. Each module, except C++, is assessed by a three-hour written examination in the beginning of the following term. In most cases, a component of assessed coursework, or a small project to be completed in a limited time, will also be required. The lecturer will specify early in the term exactly what the examination arrangements will be. Previous examination papers are usually available.

3. ECTS credits: The lecture modules taken together are worth 72 ECTS, and the project 18 ECTS.
Module Descriptions

Core modules

Autumn Term

Computing in C++, Part I: Programming in C (R. Nürnberg)

This non-assessed module will give an introduction to the programming language C. No programming experience in C is required to follow this module. Attending this module will help students complete the practical assignments of other modules. It will be followed in the second term by an introduction to Object Oriented Programming in C++.

Mathematical Finance: an Introduction to Option Pricing Theory (N. Bingham)

This module is an introduction to option pricing theory, a core area of Mathematical Finance, and its mathematical and conceptual underpinnings. The goal is to familiarise students with the tools and methods of continuous-time arbitrage pricing theory, in the setting of the Black-Scholes model. Probabilistic tools - Brownian motion, the Ito integral, stochastic calculus- will be introduced in a self-contained manner and further explored in the Stochastic Processes module.

Quantitative Risk Management (M. Pakkanen)

After the financial crisis of 2007-2008, in particular, it has been understood how important proper risk management is for the solvency of financial institutions and for the stability of the entire financial system. This course introduces the key concepts and methods of quantitative risk management, with an emphasis on market risk and volatility. We endeavour to cover the following topics:

- Risk management and stylised facts: taxonomy of risks, the regulatory framework, overview of quantitative risk management, stylised facts of asset returns.
- Basic concepts of risk management: risk factors, loss distributions, risk measures (including value-at-risk and expected shortfall), historical simulation, Monte Carlo simulation, backtesting.
- Univariate time series and volatility modelling: ARMA and GARCH models, estimation and forecasting, applications to risk measures.
- Heavy-tailed distributions and extreme value theory: characterisations of heavy-tailed distributions and examples, the distribution of maxima, modelling of threshold exceedances, applications to risk measures.
- Multivariate time series and covariance modelling: multivariate time series models, multivariate GARCH models, applications to equity portfolio risk.
- Copulas and dependence modelling: basic properties of copulas, classification of copulas with examples, measuring dependence, estimation of copulas, applications to portfolio and credit risk.
- Volatility modelling with high-frequency data: volatility estimation using high-frequency data, volatility forecasting, applications to risk measures.
Stochastic Processes (T. Cass)

This module gives an introduction to probability theory and measure theory and introduces stochastic processes and the basic tools from stochastic analysis to provide the mathematical foundations for option pricing theory. It includes an intermediate introduction to axiomatic probability theory and measure theory, explaining notions like probability spaces, measures, measurable functions, integration with respect to measures, convergence concepts for random variables, joint distributions, independence and conditional expectations. It studies stochastic processes in discrete and continuous time; mainly the random walk, Brownian motion, and their properties. These in turn involve notions like the quadratic variation, the reflection principle, the Markov property and the martingale property. We will cover the stochastic Ito integral, the Ito formula, and their mathematical applications; for example, stochastic differential equations and some references to partial differential equations.

Statistical Methods in Finance (M. Pistorius)

The financial industry has changed dramatically over the past few years, and the new regulations imposed to banks require more statistical knowledge. The aim of this new core module is to reflect these changes, and to make students up to date with the current needs of the financial sector. This course is concerned with essential statistical methods for the analysis of financial data. Topics covered include regression methods (including ordinary and generalised least squares), time series analysis (including ARMA, ARCH, GARCH), Bayesian analysis, parametric estimation methods (including maximum likelihood estimation and classical asymptotic theory), and non-parametric estimation methods. The various methods are illustrated by applications in finance.

Spring Term

Advanced Methods in Derivatives Pricing (A. Jacquier)

This module can be seen as the continuation of the two modules Stochastic Processes and Mathematical Finance taught in the Autumn Term. We shall revisit and go further in some of the concepts developed there, such as the Martingale Representation Theorem, Change of measure and Girsanov theorem, Quadratic variation of semimartingales, Feynman-Kac Theorem, Existence and uniqueness of SDEs. We shall in particular see these fundamental results in action, when studying the properties of the volatility surface: existence of the implied volatility and the local (Dupire) volatility for general semimartingales, existence and uniqueness of stochastic volatility models.

Computing in C++, Part II: Object oriented programming (R. Nürnberg)

The module gives an introduction to object oriented programming in C++. In contrast to structured programming, where a programming task is simply split into smaller parts, which are then coded separately, the essence of object oriented programming is to decompose a problem into related subgroups, where each subgroup is self-contained and contains its own instructions as well as the data that relates to it. Starting from the simple concept of a class that contains both data and methods relating to that data, the module will cover all the major features of object oriented programming, e.g. encapsulation, inheritance and polymorphism. To this end, the module will address operator overloading, virtual functions and templates.
Interest rate models with credit risk, collateral, funding liquidity risk, multiple curves (D. Brigo)

This is a module that deals with the theory and practice of the term structure of interest rates when including also credit risk, funding liquidity costs, collateral modelling and multiple curves. The paradigm of derivatives valuation is shifting from complex payouts designed on simple single asset class risks to simple products that are now managed by analysing previously neglected complex and interconnected nonlinear risks. The module starts by briefly putting derivatives valuation into context, in connection also with the onset of the 2007-2008 crisis that prompted many of the changes we are seeing now. The module then moves to classic interest rate models based on a risk free rate, on classical instantaneous forward rates, and on default free LIBOR and SWAP rates, also in presence of volatility smile. Several families of models are introduced and studied in detail, with an eye both to a rigorous theoretical derivation and to practical implementation and calibration. Following the classical part, the increasingly important issues of multiple discount curves, credit risk, credit and debit valuation adjustments, collateral modelling, gap risk and funding liquidity costs are analysed quantitatively. The related notions of CVA, DVA and FVA are analysed and criticised in detail, and their significance for the general derivatives valuation paradigm is discussed. The specific case of trading through central clearing (CCPs) is hinted at. Finally, an analysis of Risk measures for interest rate derivatives products is presented, with a case study highlighting the role of correlation and dependence in Risk measurement.

Elective modules

Algorithmic Trading and Machine Learning (G. Di Graziano and S. Ramaswamy)

The aim of the module is to present a series of cutting-edge topics in the area of “Algorithmic trading” in a unified and systematic fashion. For each of the problems presented, we try to emphasise both the mathematical theory as well as industry applications. The module consists of two main parts: 1) Optimal Execution Problems and 2) Machine Learning in Finance. Optimal execution techniques are particularly relevant for market makers and quantitative brokers whereas machine learning is often used by hedge fund and prop desks to generate trading signals. However machine learning algorithms can be also applied as part of optimal execution tools, for example in order to choose order types or speed of execution. The basic optimal execution problem consists of an agent (e.g. a bank or a broker) who needs to buy or sell a pre-specified number of units of a given asset within a fixed time frame (e.g. an hour, a day, etc). Assuming that the purchase or sale of the asset will have an impact on its price, what is the execution policy which minimises market impact? Having decided on the execution schedule, what type of order (market or limit order) is better to submit? The first problem can be formulated as a trade-off between the expected execution cost and the price risk due to exogenous factors. We shall solve the optimisation problem for different types of

- Price dynamics (ABM vs GBM, with or without drift);
- Market impact type (temporary, transient, permanent);
- Exogenous Risk functions (variance, Value at Risk).

Machine learning techniques are becoming increasingly popular in the financial industry. They are typically used to help predict asset price patterns, volatility regimes, etc. The module starts by formalising the concept of “learning” and providing an overview of various learning
techniques. The subsequent lectures analyse in detail some of the most popular machine learning algorithms such as neural networks and support vector machines. We then introduce various smoothing tools (kernel regression, wavelets, HHTs) which have historically been developed for signal processing applications but have found their way into finance over the last few years. Those methods can be used as stand-alone or jointly with other learning algorithms, e.g. SVM. Finally, we shall analyse issues related to model selection and how to combine different models to improve the learning outcome. Trading applications using real market data will be presented during the module.

**Dynamic Portfolio Theory (H. Zheng)**

This is an introductory course on dynamic portfolio theory. The objective is to cover the basic mathematical methods for solving DPT problems. We will discuss Merton's optimal investment problem, utility maximisation in complete and incomplete markets, stochastic control, dynamic programming principle, HJB equation, classical solution, verification theorem, viscosity solution, convex duality, martingale representation, dual stochastic control, Markov modulated model, etc. We will also discuss many applications, including utility indifference pricing, wealth maximisation, optimal liquidation, turnpike property, mean-variance portfolio with constraints, quadratic hedging...

**Fixed Income Markets (R. Martin)**

This module is an introduction to fixed income markets and instruments. We will discuss how fixed income instruments are priced and traded. Particular emphasis will be given to the mechanics of trading the products, how to calculate P&L for a trade, how to understand the simpler aspects of trade ideas and "strategy pieces" put out by bank trading desks, and how to conceptualise risk and risk management.

**Convex Analysis and Optimization (P. Siorpaes)**

- Convex sets: convexity-preserving operations, convex, conical and affine hulls, relative interior, projection on closed convex sets, polar sets and bipolar theorem, recession and barrier cones, normal and tangent cones, extreme points and Krein-Milman Theorem, Hahn-Banach separation theorem
- Convex functions: convexity-preserving operations, lower-semicontinuity, first and second order differentiability, characterizations, difference of convex functions, subdifferential and its properties, regularizations of a convex function, convex conjugate function (a.k.a. Fenchel-Legendre transform)
- Optimization: formulation of constrained convex optimization problems, Lagrangian function and multipliers, dual problem, optimality conditions, saddle points, Fenchel’s duality theorem
- Some applications (in simplified settings): fundamental theorem of asset pricing, optimal investment, Kantorovich duality in optimal transport

**Lévy Processes: Theory and Applications (M. Pistorius)**

In this module we present an introduction to the theory of Lévy processes, a fundamental class of continuous time stochastic processes, which includes the Poisson process, the Wiener
process and the stable process and which is encountered in many financial modelling applications. We start by considering jump-diffusions and develop the corresponding stochastic calculus for this class of stochastic processes. By way of illustration, a number of financial applications are developed. We then move on to infinitely divisible distributions, the Lévy-Khintchine formula, Lévy-Ito decomposition and discuss simulation of paths of general Lévy processes. When time permits we cover elements of Markov process theory.

**Numerical Methods for Finance (A. Jacquier)**

In this module we will explore some of the main numerical tools anyone working in a quantitative field should know, namely finite difference methods for PDEs, numerical integration, optimisation methods and Fourier methods. We shall endeavour to strike a balance between the theoretical aspects of these tools and their practical implementations in mathematical finance.

**Simulation Methods for Finance (H. Zheng)**

This module is an introduction to simulation methods in finance and more generally to probabilistic numerical methods for PDEs. It starts with discussion of random number generators, statistical tests and moves on to cover numerical schemes for solving Stochastic Differential Equations: the Euler, Milstein and certain higher-order schemes. Properties of weak and strong convergence, consistency and numerical stability are established. It then discusses variance reduction techniques and estimation of sensitivities. The module will be concluded by studying a numerical method for American Options and non-linear PDEs, if time permits.

**Stochastic Differential Equations (T. Cass)**

This is an advanced course on stochastic differential equations. It will build upon the theory of stochastic integration developed in the first term course Stochastic Processes (M5MF3). The following topics will be covered:

- A review of Brownian motion, and stochastic integration with respect to continuous semimartingales. Applications will include Itô’s formula, the exponential martingale inequalities, Girsanov’s theorem, the Dubins-Schwartz characterisation of continuous local martingales, the martingale representation theorem, the Burkholder-Davis-Gundy inequalities, Stratonovich calculus and Tanaka’s formula.
- One-dimensional SDEs and diffusion processes. The Yamada-Watanabe theorem. Examples and applications.
Statistics for Extreme Events (R. Noven)

This module introduces extreme value theory. We focus on statistical methods for extreme events and study applications in insurance and finance. The main topics are as follows:

Extreme value theory: Fluctuations of maxima; fluctuations of upper order statistics; Statistical Methods: Probability and quantile plots; mean excess function; Gumbel's method of exceedances; parameter estimation for the generalised extreme value distribution; estimating under maximum domain of attraction conditions; fitting excess over a threshold.

Financial Econometrics (M. Pakkanen)

Financial econometrics is an interdisciplinary area focusing on a wide range of quantitative problems arising from finance. This module gives an introduction to the field and presents some of the key statistical techniques needed to deal with both low and high frequency financial data. Main topics of are: Discrete time framework: ARCH, GARCH models and their estimation; Continuous time framework: Brownian motion, stochastic integration and stochastic differential equations, Itô’s formula, stochastic volatility, realised quadratic variation and its asymptotic properties, Lévy processes, testing for jumps, volatility estimation in the presence of market microstructure effects.

MSc Prizes

Two prizes are available for the best MSc thesis:

- NATIXIS Prize for best Master’s Thesis in Quantitative Finance
- Palgrave Macmillan Award for Best MSc Thesis in Mathematics and Finance
3. Placements and Project

The College defines a placement as:

“work experience, assessed project work, a period of course-based study or a period of research (for which academic credit is awarded and/or where the student remains subject to College student regulations during the relevant period) and where there is a transfer of direct supervision of the student to a third party (i.e. where a member of staff at the third party acts as the day-to-day supervisor/manager) for a period of two weeks or more.”

Academic departments are responsible for managing any study or work placement which forms part of your degree programme. It is expected that you will contribute to the process of planning your placement.

For guidance on this, see the College’s Placement and Learning Policy and associated good practice:

www.imperial.ac.uk/about/governance/academic-governance/academic-policy/placement-learning

Your Departmental Placement Coordinators:

- Marta Guzzon
- Louise Rowland
- Dr Antoine Jacquier

Overview

The project is a substantial component of the MSc in Mathematics and Finance, occupying up to four months of the MSc programme. It is a piece of original work undertaken by you under the direction of an academic project supervisor and in most cases also an external supervisor. Our intention is that most projects will be carried out in association with a bank, finance house, hedge fund, consultancy, or systems provider in the finance industry, and we endeavour to arrange suitable placements. The project may be an ‘internship’, where you work at the bank full time, or a collaborative arrangement where you work in the College and visit the company on a regular basis to discuss the project. In either case you will be assigned an academic project supervisor who will be a member of staff of the Mathematical Finance Section.

Arranging placements is a complex process where we are ultimately dependent on the goodwill of our industrial partners and on market conditions. Students must also bear in mind that they must pass companies’ own assessment processes before being offered a placement. It cannot be guaranteed that everybody will get exactly what he or she wants, but every effort will be made to achieve reasonably satisfactory arrangements. If you have your own contacts in the industry, or specific ideas as to your project topic, you should discuss these with your tutor at the earliest possible time, so that these can be taken into consideration.

We will be using software InPlace to manage the Placement administration and more guidance will be made available to you during the year. Below are some of the methods in which we allocate placements.
Company presentations

From October there will be a series of talks given by our industry partners. These events provide an opportunity for students to find out more about companies and also offers the chance to network with employees in an informal environment. You will be invited to apply to their internship programmes after attending the events.

CV Book

Early on in the course students are asked to provide us with their CVs. These are collated into a CV book which is distributed to our industry partners, who may get in touch with students directly with intern opportunities.

Student referral

The majority of project allocation takes place from January, once the first term assessments have been completed. Opportunities will be advertised on InPlace and students will be invited to express an interest in applying. The Programme team will shortlist students based on how well the specified criteria is met. Companies then select who they wish to invite for interview. Alongside our referrals, we also expect students to be proactive in applying for placements and finding their own opportunities. Only MSc students who have achieved an acceptable level of academic competence will be offered as candidates to an external sponsor.

Placement requirements

When you seek your own placement, the duration should be at least 10 weeks and the topic of project should be quantitative in nature. If your internship or job opportunity is not compatible with a suitable project, then you can instead work on an internal project with a member of academic staff at Imperial.

Project theses must be submitted to the MSc administrator by 16.00 on Tuesday 12 September 2017. The length of the thesis is normally 30-50 typed pages, and it must be typed in LaTeX following a provided template. Two spiral-bound copies are required, together with an electronic PDF copy.

For more information on placements visit the Placements website:

[www.imperial.ac.uk/placements](http://www.imperial.ac.uk/placements)

If you are considering/planning a placement outside the UK you should also refer to the Placement Abroad Handbook:

[www.imperial.ac.uk/placements/information-for-imperial-college-students](http://www.imperial.ac.uk/placements/information-for-imperial-college-students)
4. Assessment

To obtain the degree of MSc in Mathematics and Finance you must:

   a) Take examinations in at least 10 modules, and at most 11 modules, satisfying the programme conditions described above.

   b) Achieve an overall average of at least 50% in the module examinations.

   c) Pass (mark of 50% or more) at least 8 modules out of 10 offered for examination.

   d) Achieve at least 40% in each examination.

   e) Submit and pass the Thesis.

If you take 11 examinations, the maximum number allowed, the above criteria apply to your best 10 results satisfying the programme constraints. At Imperial College the MSc degree classifications are: Distinction, Merit, Pass, and Fail. Typically only the top few candidates in any one cohort will be awarded a Distinction. To achieve a Distinction (or Merit), you must pass, at the first attempt, all 10 examinations offered, with an overall average of 70% (or 60%) or more, and be awarded a mark of at least 70% (or 60%) for the Thesis.

Notes:

1. The core modules are always included in the calculation of the number of exams passed and the total mark.

2. Attendance at examinations is compulsory. It is a College Rule that any candidate who fails to present him- or herself for examination will be deemed to have failed the entire year and will be required to re-sit all elements of the programme (even those already passed!) in the following year. Deferral of examinations can only be agreed on medical grounds and applications must be made to the MSc Administrator prior to the date of the specific examination.

3. Assessed coursework must be submitted by the announced deadline. The late submission policy is available here: [www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/academic-policy/marking-and-moderation/Penalties-for-late-submission-of-assessed-work.pdf](http://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/academic-policy/marking-and-moderation/Penalties-for-late-submission-of-assessed-work.pdf)

4. Thinking the unthinkable: If you do not achieve the above criteria, you cannot receive the MSc degree at the end of the academic year, but you have the option to retake examinations (and/or the project thesis) the following year, only once. You can only retake examinations you have failed, and—at the discretion of the lecturer—any coursework satisfactorily completed the first time may be carried forward. No fees, apart from a small examination re-entry fee, are payable the next academic year (for more information see the website [www3.imperial.ac.uk/registry/exams/resit](http://www3.imperial.ac.uk/registry/exams/resit)). Marks for resit examinations are capped at the pass mark (50%).

5. Interruption of studies: It sometimes happens that a student’s studies are interrupted for personal reasons (illness, etc). Another thing that has occasionally happened in the past is that a student is hired by a company and obliged to start work before the completion of the MSc (e.g. to participate in the company's induction training programme). If something of this sort happens to you tell the MSc Administrator straight away. It is important, for anything more
than a brief absence, to apply to the College for an “interruption of studies”, which essentially “stops the clock” while you are away. This interruption cannot exceed two years.

6. **Mitigating circumstances** (e.g. illness) can affect your academic performance, examinations and projects; if you feel they should be taken into consideration, you should inform the MSc Administrator as soon as possible. Relevant forms are available in the Appendix; see also [www.imperial.ac.uk/physics/students/current-students/student-welfare/mitigating-circumstances/](http://www.imperial.ac.uk/physics/students/current-students/student-welfare/mitigating-circumstances/)

7. **Award and classification**: they will be decided mid- to late October 2017 by the examination board, which has the final authority in these matters. The board will also consider borderline cases, and take into account mitigating circumstances. The final results are released by Registry by mid-November. During the year you will receive indications of your results in the form of letter grades, which are provisional and still subject to confirmation by the examination board. The coding used is A+=85+, A=70-84, B=60-69, C=50-59, D=40-49, E=30-39, F=0-29. Academic and Examination regulations can be found at [www3.imperial.ac.uk/registry/proceduresandregulations/regulations](http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations)

**Marking criteria MSc thesis**

**A thesis in the distinction range (70-100)** is a sustained, coherent contribution that:

- demonstrates broad understanding of the subject
- demonstrates a high level of independent and/or critical thinking
- demonstrates evidence of effective synthesis of ideas
- demonstrates thorough investigative research, high level problem-solving and creative performance
- demonstrates the ability to critically evaluate one’s own research in the context of existing literature
- may demonstrate originality in topic, method, theoretical development, creative practice or findings and conclusions (this would be expected at A+ level)
- may include material of publishable quality (this would be expected at A+ level)
- is presented to a consistently high standard

More specifically, the following subdivision applies:

- **90-100**: written to publishable standards – contains good original work, with a significant result, explained very well, with very good account of references to existing work. Presentation excellent.
- **80-89**: written to almost publishable standard – containing good original work, with interesting well-explained results, with good account of the existing literature. Good presentation.
- **70-79**: good original work, completing a new well-explained result, linked to existing literature.
Merit theses (60-69) are sound and compelling, and demonstrate evidence of critical thinking and an understanding of a significant body of knowledge. Work at this level also:

- provides a logical overall argument
- selects and applies suitable methods
- gathers original data (where applicable) and analyses it in a careful and coherent manner
- provides evidence which clearly supports its findings and arguments
- may in parts be more descriptive than evaluative or synthesised
- may not fully realise the possibilities of the research data/findings
- includes discussions / conclusions which show some appreciation of the significance of the findings
- may make fewer or weaker links to existing research, theoretical concepts or creative practice than would be expected in Distinction level work
- is presented to a generally high standard but may contain noticeable errors in referencing, punctuation, grammar and/or spelling

More specifically, the following subdivision applies:

- 65-69: some good original ideas, developed independently, but not far enough to complete a significant result; the work still explained well and with good account of and references to existing work. Close to Distinction but not quite there.
- 60-64: some good ideas, developed independently, but not far enough to reach a significant result; fair explanation of the work and with some account of and references to existing work.

A thesis in the pass range (50-59):

- demonstrates understanding and analytical ability at a level clearly beyond undergraduate level
- presents an overall argument, but may not be fully developed or consistent in its application
- outlines a research plan and applies appropriate methods
- demonstrates competence in the formulation, conduct and analysis of independent research
- is generally sound but may be uneven or limited in some respect
- may demonstrate limited evidence of synthesis and critical engagement with literature
- is likely to focus more on description than analysis of findings
- has appropriate, but limited, evidence in the support of its findings and arguments
is competent in its presentation, but may have numerous, obvious errors of referencing, punctuation, spelling and/or grammar.

More specifically, the following subdivision applies:

- **55-59**: an explanation of the problem and the work of others on it, but without much independent work of the candidate's own.
- **50-54**: as above but in some way defective – for example one from: few references, some unclear text, poorly presented; however still showing some understanding.

A thesis in the D-E-F range (0-49) demonstrates serious deficiencies in one or more elements:

- may present research literature, theory or methods ineffectively, inaccurately or unreflectively
- may lack an overall argument
- lacks breadth and depth
- lacks cohesion across the thesis
- contains limited or inappropriate evidence
- interpretation may be minimal or flawed
- poor presentation poor with many errors of referencing, punctuation, spelling, grammar

**Plagiarism**

Plagiarism is the presentation of another person’s thoughts, words, images or diagrams as though they were your own. Another form of plagiarism is self-plagiarism, which involves using your own prior work without acknowledging its reuse.

Plagiarism is considered a cheating offence and must be avoided, with particular care on coursework, essays, reports and projects written in your own time and also in open and closed book written examinations.

Where plagiarism is detected in group work, members of that group may be deemed to have collective responsibility for the integrity of work submitted by that group and may be liable for any penalty imposed, proportionate to their contribution.

For further information, please refer to the Cheating Offences Policy and Procedures section on page 35 of this handbook.
5. Board of examiners

**Board of Examiners**

- Lecturers from the Mathematical Finance Section

**External examiners**

- Prof. Kostas Kardaras, London School of Economics.

It is common for Master’s level students to have some form of academic or social interaction with their external examiners at some point during or after their studies as well as during the assessment process itself.

It is inappropriate for you to submit complaints or representations direct to external examiners or to seek to influence your external examiners. Inappropriate communication towards an examiner would make you liable for disciplinary action.

External examiners reports can be found here:

6. Location and facilities

Imperial has a number of campuses in London and the South East. All have excellent travel links and are easily accessible via public transport.

Your main location of study will be:

📍 Huxley Building
180 Queen’s Gate
London - SW7 2AZ

This is based on the South Kensington Campus.

Facilities

Level 2
MSc Student computer room - 215

Level 4
Mathematics Learning Centre – 416 contains 64 computers, two study desks fitted out with audiovisual facilities for project presentations and a range of additional study areas.

MSc Mathematics and Finance study room – 413 you will be given code to the room in the first week.

Level 6
MSc Administrator Office – 652 open Monday-Friday 9:00-17:00

Maps

Campus maps and travel directions are available at:

🌐 www.imperial.ac.uk/visit/campuses

Accessibility

Information about the accessibility of our South Kensington Campus is available online through the DisabledGo access guides:

🗠 www.disabledgo.com/organisations/imperial-college-london-2
7. Working while studying

If you are studying full time, the College recommends that you do not work part-time during term time. If this is unavoidable we advise you to work no more than 10–15 hours per week, which should be principally at weekends and not within normal College working hours.

Working in excess of these hours could impact adversely on your studies or health.

If you are here on a Tier 4 visa you can work no more than 20 hours a week during term time. Some sponsors may not permit you to take up work outside your studies and others may specify a limit.

If you are considering part-time work during term time you are strongly advised to discuss this issue with your Programme Director or course adviser. If you are on a Tier 4 visa you should also seek advice from the International Student Support team regarding visa limitations on employment.

Please refer to our policy on working while studying:

8. Health and safety

You are responsible for looking after your own health and safety and that of others affected by your College-related work and leisure activities. You must:

- comply with all local and College policies, procedures and codes of practice and with the arrangements which the College has in place to control health and safety risks.
- ensure that your activities do not present unnecessary or uncontrolled risks to yourself or to others.
- attend appropriate induction and training.
- report any accidents, unsafe circumstances or work-related ill health of which you become aware to the appropriate person.
- not interfere with any equipment provided for Health and Safety.
- inform your supervisor or the person in charge of the activity in cases where you are not confident that you are competent to carry out a work or leisure activity safely, rather than compromise your own safety or the safety of others.

The College's Health and Safety Policy can be found at:


Your Departmental safety contact is:

- Andy Pope
- 131 Huxley
- 020 7594 8544
- a.pope@imperial.ac.uk

The College Safety Department

The Safety Department offers a range of specialist advice on all aspects of safety. This includes anything which you feel might affect you directly, or which may be associated with teaching, research or support service activities. The College’s activities range from the use of hazardous materials (biological, chemical and radiological substances) to field work, heavy or awkward lifting, driving, and working alone or late. All College activities are covered by general health and safety regulations, but higher risk activities will have additional requirements.

The Safety Department helps departments and individuals ensure effective safety management systems are in place throughout the College to comply with specific legal requirements. Sometimes the management systems fail, and an accident or a near-miss incident arises; it is important that we learn lessons from such situations to prevent recurrence and the Safety Department can support such investigations. All accidents and incidents should be reported online at:

[www.imperial.ac.uk/safety](http://www.imperial.ac.uk/safety)
To report concerns or to ask for advice you should contact your programme director, academic supervisor or departmental safety officer in the first instance. You may also contact the Safety Department directly.

**Occupational Health requirements**

The College Occupational Health Service provides services to:

- **protect health at work**
- **assess and advise on fitness for work**
- **ensure that health issues are effectively managed**

The Service promotes and supports a culture where the physical and psychological health of staff, students and others involved in the College is respected, protected and improved whilst at work.

[www.imperial.ac.uk/occupational-health](http://www.imperial.ac.uk/occupational-health)
9. College policies and procedures

Regulations for students
All registered students of the College are subject to the Regulations for Students, the College Academic and Examination Regulations and such other regulations that the College may approve from time to time.

[www.imperial.ac.uk/about/governance/academic-governance/regulations][www.imperial.ac.uk/students/terms-and-conditions]

Appeal and complaints procedures
We have rigorous regulations in place to ensure assessments are conducted with fairness and consistency. In the event that you believe that you have grounds for complaint about academic or administrative services, or wish to appeal the outcome of an assessment or final degree, we have laid out clear and consistent procedures through which complaints and appeals can be investigated and considered:

[www.imperial.ac.uk/about/governance/academic-governance/academic-policy/complaints-appeals-and-discipline]

Academic integrity
You are expected to conduct all aspects of your academic life in a professional manner. A full explanation of academic integrity, including information on the College’s approach to plagiarism is available on the Student Records and Data website:

[www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/plagiarism-academic-integrity-exam-offences]

Cheating offences policy and procedures
It is important that you learn how to properly attribute and acknowledge the work, data and ideas of others. Plagiarism is scientific misconduct, and students whose assessments can be shown to contain plagiarism are subject to penalties as outlined in the College’s Cheating Offences Policy and Procedures – see Appendix 3 of the Examination Regulations which can be found here:

[www.imperial.ac.uk/about/governance/academic-governance/regulations]

Intellectual property rights policy
For further guidance on the College’s Intellectual Property Rights Policy, please contact the Research Office:

[www.imperial.ac.uk/research-and-innovation/research-office/ip]
Use of IT facilities


10. Well-being and advice

Student Space
The Student Space website is the central point for information on health and well-being.

www.imperial.ac.uk/student-space

Director of Student Support
The Director of Student Support has overall responsibility for all matters relating to student support and well-being.

www.imperial.ac.uk/people/d.wright

Departmental support and College tutors
Your Department has a system of academic and pastoral care in place to make sure you have access to the appropriate support throughout your time here. This includes:

Postgraduate welfare tutor
The Department’s postgraduate tutor can offer pastoral support and advice. You can arrange to have a meeting with him at any time during your studies – what you discuss will be completely confidential.

If necessary they will direct you to an appropriate source of support.
College tutors

College tutors operate outside of any department. They provide guidance and assistance to students in regard to welfare issues and are also involved in College disciplinary matters involving students. For more information see:

- [www.imperial.ac.uk/student-space/h...college-tutors-and-departmental-support](http://www.imperial.ac.uk/student-space/h...college-tutors-and-departmental-support)

Advice services

The tutor system is complemented by a College-wide network of advice and support. This includes a number of specialist services.

Careers Service

The Careers Service has strong links to your Department and you will have a named Careers Consultant and Placement and Internship Adviser who will run both group sessions and individual meetings within your Department. You can arrange to meet with your linked Careers Consultant or Placement and Internship Adviser either in your Department or centrally on Level 5 Sherfield where the Careers Service is based.

Visit the Career Service's website to:

- Book a careers appointment
- Find resources and advice on successful career planning

- [www.imperial.ac.uk/careers](http://www.imperial.ac.uk/careers)

Counselling and Mental Health

The Student Counselling and Mental Health Advice Service offers short-term counselling to all registered students. The service is free and confidential. Counsellors are available at the South Kensington, Hammersmith and Silwood Park Campuses.

- [www.imperial.ac.uk/counselling](http://www.imperial.ac.uk/counselling)

Financial support and tuition fees

If you’ve got any questions about student financial support (loans, scholarships and research council studentships, US and Canadian loans) then contact the Student Financial Support team:

- 020 7594 9014
- [student.funding@imperial.ac.uk](mailto:student.funding@imperial.ac.uk)
If you suddenly find yourself in financial difficulties or experience an unexpected change in circumstances, you may be eligible to apply for emergency financial help through the Student Support Fund. The Fund offers a one-off payment of up to £2,000 to cover such emergencies as last minute accommodation and travel necessities, equipment and childcare. It does not have to be repaid.

www.imperial.ac.uk/students/fees-and-funding/student-support-fund

For tuition fees queries, contact the Tuition Fees team:

020 7594 8011

tuition.fees@imperial.ac.uk

**Imperial College Union (ICU) Advice Centre**

Imperial College Union runs the Advice Centre independently of the College with advisers on hand to provide free, confidential, independent advice on a wide range of welfare issues including housing, money and debt, employment and consumer rights, and personal safety.

www.imperialcollegeunion.org/advice

**Student Hub**

The Student Hub represents a single point of contact for all key administrative information and support. The Student Hub team can help you with enquiries about:

- Accommodation (including checking contracts for private accommodation)
- Admissions
- International student enquiries
- Research degrees
- Student financial support
- Student records
- Tuition fees

Level 3, Sherfield Building, South Kensington Campus

020 7594 9444

student.hub@imperial.ac.uk

www.imperial.ac.uk/student-hub

**Health services**

**NHS Health Centre and finding a doctor**
Even if you’re fit and healthy we recommend that you register with a local doctor (GP) as soon as you arrive in London. For help finding your nearest GP see the Student Space website:

- [www.imperial.ac.uk/student-space/here-for-you/find-a-doctor](http://www.imperial.ac.uk/student-space/here-for-you/find-a-doctor)

There is an NHS Health Centre on our South Kensington Campus which you may visit during clinic hours if you’re feeling unwell. Students living within the practice catchment area are encouraged to register with the Centre.

- [www.imperialcollegehealthcentre.co.uk](http://www.imperialcollegehealthcentre.co.uk)

**NHS Dentist (based in the Health Centre)**

Imperial College Dental Centre offers a full range of NHS and private treatment options.

- [www.imperial.ac.uk/student-space/here-for-you/dentist](http://www.imperial.ac.uk/student-space/here-for-you/dentist)

**Disability support**

**Disability Advisory Service**

The Disability Advisory Service provides confidential advice and support for all disabled students and students with specific learning difficulties.

If you think you may have dyslexia or another specific learning difficulty but have never been formally assessed, the Disability Advisory Service offers initial screening appointments.

- Room 566, Level 5, Sherfield Building, South Kensington Campus
- 020 7594 9755
- disabilities@imperial.ac.uk
- [www.imperial.ac.uk/disability-advisory-service](http://www.imperial.ac.uk/disability-advisory-service)

**Departmental Disability Officers**

Departmental Disability Officers are the first point of contact within your department. They can apply for additional exam arrangements on your behalf, and will facilitate support within your Department.

**Mathematics Department Disability Officer**

Dr Tony Bellotti
522 Huxley
pgr.welfare@imperial.ac.uk

More information on Departmental Disability Officers is available at:

- [www.imperial.ac.uk/disability-advisory-service/support/ddos](http://www.imperial.ac.uk/disability-advisory-service/support/ddos)
More information on procedures for the consideration of additional exam arrangements in respect of disability is available at:


**Library and IT**

**Information and Communications Technologies (ICT)**

If you’re having problems with technology (including computers, laptops and mobile devices), you can get help from ICT’s Service Desk.

- [www.imperial.ac.uk/ict/service-desk](http://www.imperial.ac.uk/ict/service-desk)

**Software shop**

The Software shop offers a variety of general and subject specific software programs and packages for free or at a discounted price for Imperial students.

- [www.imperial.ac.uk/admin-services/ict/shop/software](http://www.imperial.ac.uk/admin-services/ict/shop/software)

**Library services**

The Central Library at South Kensington is open around the clock pretty much all year. Make sure you find out who your departmental librarian is as they’ll be able to help you find resources for your subject area. Also, don’t forget to check out the Library’s range of training workshops and our other campus libraries for access to specialist medicine and life sciences resources. Alongside these physical spaces and resources, the Library provides over 170,000 electronic books, journals and databases available both on and off campus and a free document delivery service to help you source books and articles from around the UK and the rest of the world:

- [www.imperial.ac.uk/library](http://www.imperial.ac.uk/library)

**Religious support**

The Chaplaincy Multi-faith Centre has chaplains from many different religions, as well as prayer rooms and information on places of worship. In addition, it runs meditation classes and mindfulness workshops for stress management. There is a student-run Islamic prayer room on campus and separate areas available for male and female Muslims.

- [www.imperial.ac.uk/chaplaincy](http://www.imperial.ac.uk/chaplaincy)
Support for international students

**English language support**

The Centre for Academic English provides free in-sessional English courses for international students while they are studying. These include classes and workshops on academic language, social language, the four skills of reading, writing, listening and speaking, 1-1 consultations with a tutor to work on a piece of academic writing or an oral presentation, self-study resources in the VLE Blackboard, and the Conversation Project, which partners students with a native-speaker volunteer to practise social and conversational English.

[www.imperial.ac.uk/academic-english](http://www.imperial.ac.uk/academic-english)

**International Student Support team**

Students from outside the UK make up around half of our student population, so our International student Support team offers year-round support to help our international students settle into Imperial life. This includes UK visa and immigration advice and trips to different places of interest.

[www.imperial.ac.uk/study/international-students](http://www.imperial.ac.uk/study/international-students)
11. Student Records and Data

The Student Records and Data team are responsible for the administration and maintenance of the student records for all students studying at the College. This includes enrolments, programme transfers, interruption of studies, withdrawals and processing of examination entry for research degree students. The team also use this information to fulfil reporting duties to the Student Loans Company, Transport for London and the UKVI, as well as other external bodies.

The team is currently responsible for the processing of student results and awards on the student record system as well as the production and distribution of academic transcripts and certificates of award.

Student Records and Data produce a variety of standard document requests for both current and previous students including council tax letters, standard statements of attendance and confirmation of degree letters.

Appeal administration also sits within the team, as does the responsibility for confirming qualifications via the Higher Education Degree Datacheck service.

**Student records and examinations**

- **+44 (0)20 7594 7268**
- **records@imperial.ac.uk**

**Degree certificates**

- **+44 (0)20 7594 8037**
- **certificates@imperial.ac.uk**
12. Work-life balance

The pace and intensity of postgraduate study at Imperial can be demanding so it’s important to find time for outside interests.

Imperial College Union
The Union’s range of 340+ student-led clubs, societies and projects is one of the largest of any UK university, opening up lots of ways for you to enjoy your downtime.

[www.imperialcollegeunion.org/about-us](http://www.imperialcollegeunion.org/about-us)

Graduate Students’ Union
The Graduate Students’ Union is the postgraduate arm of Imperial College Union. The GSU works alongside the Imperial College Union President to ensure that the requirements of postgraduate students are catered for. It also organises a number of academic and social events during the year.

[www.union.ic.ac.uk/presidents/gsu](http://www.union.ic.ac.uk/presidents/gsu)

Sport
Beginners and semi-professionals alike will receive a warm welcome in our sports clubs, which are subsidised by Imperial College Union to make it a little bit cheaper to keep doing a sport you love.

Access to swimming facilities, including sauna, steam room and spa at Ethos sports centre, is completely free from your very first day. Gym facilities across all campuses are also free after you’ve completed a fitness orientation for a one-off charge (£40 in 2016–17).

[www.imperial.ac.uk/sport](http://www.imperial.ac.uk/sport)
13. Student feedback and representation

Feedback from students
The College and Union is committed to continually improving your education and wider experience and a key part of this is your feedback. Feedback is thoroughly discussed by your student representatives and staff.

Student representation
Student Representatives are recruited from every department to gather feedback from students to discuss with staff. More information about the role, and instructions on how to become an academic representative, are available on the Imperial College Union (ICU) website.

www.imperialcollegeunion.org/your-union/your-representatives/academic-representatives/overview

Staff-Student Committee
The Staff-Student Committee is designed to strengthen understanding and improve the flow of communication between staff and students and, through open dialogue, promote high standards of education and training, in a co-operative and constructive atmosphere. College good practice guidelines for staff-student committees are available here:

www.imperial.ac.uk/about/governance/academic-governance/academic-policy/student-feedback
14. Student surveys

Your feedback is important to your department, the College and Imperial College Union.

Whilst there are a variety of ways to give your feedback on your Imperial experience, the following College-wide surveys give you regular opportunities to make your voice heard:

- **PG SOLE lecturer/module Survey**
- **Student Experience Survey (SES)**
- **Postgraduate Taught Experience Survey (PTES) – next due to run in spring 2018**

The PG SOLE lecturer/module survey runs at the end of the autumn and spring terms. This survey is your chance to tell us about the modules you have attended and the lecturers who taught them.

For PG SOLE your lecturers will receive their individual numerical results and comments shortly after the survey closes. To make the most of your opportunity to give your feedback, please do not use offensive language or make personal, discriminatory or abusive remarks as these may cause offence and may be removed from the results. Whilst this survey is anonymous, please avoid self-identification by referring to personal or other identifying information in your free text comments.

The Student Experience Survey (SES) is another opportunity to leave your views on your experience. This survey will cover your induction, welfare, pastoral and support services experience.

The Postgraduate Taught Experience Survey (PTES) is the only national survey of Master’s level (MSc, MRes, MBA and MPH) students we take part in. This is the only way for us to compare how we are doing against the national average and to make changes that will improve our Master’s students’ experience in future. PTES covers topics such as motivations for taking the programme, depth of learning, organisation, dissertation and professional development. PTES last ran in spring term 2016 and will run again in spring 2018.

All these surveys are anonymous and the more students that take part the more representative the results so please take a few minutes to give your views.

The Union’s “You Said, We Did” campaign shows you some of the changes made as a result of survey feedback:

- [www.imperialcollegeunion.org/you-said-we-did](http://www.imperialcollegeunion.org/you-said-we-did)

If you would like to know more about any of these surveys or see the results from previous surveys, please visit:

- [www.imperial.ac.uk/studentsacademic-support/student-surveys/pg-student-surveys](http://www.imperial.ac.uk/studentsacademic-support/student-surveys/pg-student-surveys)

For further information on surveys, please contact the Registry’s Surveys Team at:

- [surveys.registrysupport@imperial.ac.uk](mailto:surveys.registrysupport@imperial.ac.uk)
Alumni services
When you graduate you will be part of a lifelong community of over 190,000 alumni, with access to a range of alumni benefits including:

- discounts on further study at the College and at Imperial College Business School
- alumni email service
- networking events
- access to the Library and online resources
- access to the full range of careers support offered to current students for up to three years after you graduate
- access to our Alumni Visitor Centre at the South Kensington Campus, with free Wifi, complimentary drinks, newspapers and magazines, and daytime left luggage facility

Visit the Alumni website to find out more about your new community, including case studies of other alumni and a directory of local alumni groups in countries across the world.

www.imperial.ac.uk/alumni