



THE LONDON SCHOOL  
OF ECONOMICS AND  
POLITICAL SCIENCE ■

# MSc in APPLICABLE MATHEMATICS



**Student Handbook 2016/7**

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# Welcome to the Mathematics Department

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## Welcome!

On behalf of the entire Department, we would like to welcome you to the MSc in Applicable Mathematics, and to the Department of Mathematics at LSE. We encourage you to read this Handbook during your first few days at LSE, and we trust that you will find the information useful. There are many other places where you can find important information about LSE and about your degree. Where appropriate, we give pointers to these in this booklet. Please make sure you take a look at these as well.

We hope you have a fruitful and enjoyable time here!

### **Peter Allen**

#### **Programme Director**

#### **MSc Applicable Mathematics**

The MSc Programme Director is in overall charge of all academic aspects of this specific MSc degree.

### **Rebecca Batey**

#### **MSc Programme Manager**

The MSc Programme Manager deals with all non-academic aspects of the MSc degrees in the Department, and should normally be your first point of contact for such matters.

### **Martin Anthony**

#### **Head of Department**

The Head of Department is in overall charge of all academic activities, students and staff, and programmes offered by the department.

## Contact details

### **Address:**

Department of Mathematics  
The London School of Economics and  
Political Science  
Houghton Street  
London  
WC2A 2AE

**Telephone:** 020 7955 7925

**Email:** [maths.info@lse.ac.uk](mailto:maths.info@lse.ac.uk)

**Website:** [www.lse.ac.uk/maths/](http://www.lse.ac.uk/maths/)

**Twitter:** @LSEMaths

**Blog:** <http://blogs.lse.ac.uk/maths/>

Central telephone switchboard LSE:

+ 44 (0) 20 7405 7886

## Important Dates

### **Academic Year 2016/2017**

#### **Term Dates**

#### **Michaelmas Term (MT)**

Thursday 22 September 2016 - Friday 9 December 2016

(Teaching begins on Monday 26 September 2016)

#### **Lent Term Exams (LT)**

Tuesday 3 January 2017 - Friday 6 January 2017

#### **Lent Term (LT)**

Monday 9 January 2017 - Friday 24 March 2017

#### **Summer Term (ST)**

Monday 24 April 2017 - Friday 9 June 2017

## School closures

The School will also be closed on English public holidays. In 2016/2017 these will be:

<b>Christmas Closure</b>	Thursday 22 December 2016 – Monday 2 January 2017
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<b>Easter Closure</b>	Thursday 13 April 2017 – Thursday 20 April 2017
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<b>May Bank Holiday</b>	Monday 1 May 2017
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<b>Spring Bank Holiday</b>	Monday 29 May 2017
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<b>Summer Bank Holiday</b>	Monday 28 August 2017
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Some facilities, such as the Library, may open on some of these dates. The School will issue updates throughout the year.

## Members of the Department and contact details

Name	Room	Internal Extension	Calling from outside LSE
<a href="#">Dr Peter Allen</a>	COL 4.05	6289	020 7955 6289
<a href="#">Prof Martin Anthony</a>	COL 3.13	7623	020 7955 7623
<a href="#">Dr Tugkan Batu</a>	COL 4.04	6540	020 7955 6540
<a href="#">Prof Norman Biggs</a>	COL 3.15	7858	020 7955 7858
<a href="#">Dr Julia Böttcher</a>	COL 4.03	7492	020 7955 7492
<a href="#">Prof Graham Brightwell</a>	COL 3.03	7624	020 7955 7624
<a href="#">Dr Christoph Czichowsky</a>	COL 3.11	2954	020 3486 2954
<a href="#">Dr Albina Danilova</a>	COL 4.09	7371	020 7955 7371
<a href="#">Dr Paul Dütting</a>	COL 3.08	7640	020 7955 7540
<a href="#">Dr Pavel Gapeev</a>	COL 4.10	6120	020 7955 6120
<a href="#">Prof Olivier Gossner</a>	COL 2.05D	3755	020 7852 3755
<a href="#">Prof Jan van den Heuvel</a>	COL 3.07	7632	020 7955 7625
<a href="#">Dr Eleni Katirtzoglou</a>	COL 2.05C	7325	020 7955 7325
<a href="#">Dr Ioannis Kouletsis</a>	COL 2.05C	7325	020 7955 7325
<a href="#">Dr Andy Lewis-Pye</a>	COL 3.12	2955	020 3486 2955
<a href="#">Dr Arne Lokka</a>	COL 4.08	6279	020 7955 6279
<a href="#">Dr Katerina Papadaki</a>	NAB 3.14	6538	020 7955 6538
<a href="#">Prof Adam Ostaszewski</a>	COL 4.06	7656	020 7955 7656
<a href="#">Dr Johannes Ruf</a>	COL 3.06	7620	020 7955 7620
<a href="#">Dr Amol Sasane</a>	COL 2.05B	6106	020 7955 6106
<a href="#">Dr Robert Simon</a>	COL 4.07	6753	020 7955 6753
<a href="#">Dr Jozef Skokan</a>	COL 3.04	7008	020 7955 7008
<a href="#">Prof Gregory Sorkin</a>	NAB 3.19	1228	020 7106 1228
<a href="#">Prof Bernhard von Stengel</a>	COL 4.12	6438	020 7955 6438
<a href="#">Dr Konrad Swanepoel</a>	COL 3.09	5095	020 7107 5095
<a href="#">Dr László Végh</a>	NAB 3.05	7591	020 7955 7591
<a href="#">Dr Luitgard Veraart</a>	COL 4.11	5062	020 7107 5062
<a href="#">Dr James Ward</a>	COL 4.14	6456	020 7955 6456
<a href="#">Dr Giacomo Zambelli</a>	NAB 3.07	1265	020 7106 1265
<a href="#">Prof Mihail Zervos</a>	COL 4.02	3751	020 7852 3751

Administrative Staff	Room	Ext	Email
<b>Rebecca Batey</b> MSc Programme Manager	COL 4.01	7925*	<a href="mailto:R.Batey@lse.ac.uk">R.Batey@lse.ac.uk</a>
<b>Jackie Everid</b> Undergraduate Co-ordinator	COL 4.01	1193	<a href="mailto:J.L.Everid@lse.ac.uk">J.L.Everid@lse.ac.uk</a>
<b>Enfale Farooq</b> Departmental Administrator	COL 4.01	7732*	<a href="mailto:E.Farooq@lse.ac.uk">E.Farooq@lse.ac.uk</a>
<b>Rebecca Lumb</b> Research Administrator	COL 3.14	7494*	<a href="mailto:R.C.Lumb@lse.ac.uk">R.C.Lumb@lse.ac.uk</a>
<b>Kate Barker</b> Departmental Manager	COL 3.10	6373*	<a href="mailto:K.Barker@lse.ac.uk">K.Barker@lse.ac.uk</a>

\*To telephone these 4 staff directly from outside LSE, dial 020 7955 followed by the extension number.

\*\*To telephone Jackie Everid directly from outside LSE, dial 020 7106 1193.

All rooms are located on the 2nd, 3rd and 4th Floor of Columbia House. The entrance to Columbia House is on the Aldwych, next to the LSE Garrick.

All 'NAB' rooms are on the 3rd floor of the New Academic Building

## Research interests of academic staff

**Dr Peter Allen:** Extremal combinatorics (especially graphs and uniform hypergraphs), asymptotic enumeration, Ramsey theory, random discrete structures.

**Professor Martin Anthony:** Mathematical aspects of machine learning, particularly probabilistic modelling of learning and discrete mathematical problems in the theory of learning, data mining and artificial neural networks; Boolean function classes and their representations.

**Dr Tuğkan Batu:** Algorithms and theory of computation; particularly, randomized computation, sublinear algorithms on massive data sets, property testing, computational statistics.

**Dr Julia Böttcher:** Extremal combinatorics, random discrete structures, Ramsey theory, algorithmical and structural graph theory, graph colouring.

**Professor Graham Brightwell:** Combinatorics in general, especially finite partially ordered sets, probabilistic methods, and algorithmic aspects.

**Dr Christoph Czichowsky:** Financial mathematics, stochastic analysis, stochastic optimal control; portfolio optimization, mathematical structure of financial markets and optimal investment strategies, markets with transaction costs, market frictions, mean-variance hedging.

**Dr Albina Danilova:** Stochastic calculus and financial mathematics, in particular: filtering, enlargement of filtrations and stochastic control and optimisation; derivatives pricing and hedging in incomplete markets and/or under asymmetric information, utility maximization and equilibrium.

**Dr Paul Dütting:** Algorithms, Game Theory, and Mechanism Design.

**Dr Pavel Gapeev:** Stochastic calculus, optimal stopping and free-boundary problems, pricing of American options, sequential testing and disorder detection problems, interest rate and credit risk models, illiquidity markets, stochastic impulse control and optimization, Gaussian processes.

**Professor Olivier Gossner:** Game theory; Economics of information, bounded rationality and complexity.

**Professor Jan van den Heuvel:** Graph and matroid theory; applications and algorithmic aspects of graph theory; mathematical aspects of frequency assignment problems.

**Dr Andrew Lewis-Pye:** Logic, computability, algorithms, randomness, game theory, agent based models, networks.

**Dr Arne Lokka:** Probability and financial mathematics, with special emphasis on hedging and pricing of derivatives, utility maximization and equilibrium and real investment decisions under uncertainty.

**Professor Adam Ostaszewski:** Mathematical finance, with a particular interest in real options and accounting theory, including Corporate Disclosure policy and Bargaining Theory. Other research interests include set-theoretic and general topology and topics in analysis such as automatic continuity and regular variation.

**Dr Katerina Papadaki:** Approximate dynamic programming algorithms; cooperative game theory; discrete optimization; network games; network optimization; patrolling games; reoptimization; robust optimization; routing; scheduling; shortest path tree games; stochastic dynamic programming; stochastic programming; transportation; wireless network problems

**Dr Johannes Ruf:** The modelling of dynamic systems that arise in finance and economics.

**Dr Amol Sasane:** Applied Analysis. In particular, control theoretic problems for models described by partial differential equations.

**Dr Robert Simon:** Stochastic games and dynamic systems, games of incomplete information, ergodic theory and topology, matroids and other shellable simplicial complexes.

**Professor Jozef Skokan:** Extremal set theory, quasi-random structures, probabilistic combinatorics, discrete geometry, graph theory, combinatorial games and topics in theoretical computer science.

**Professor Gregory Sorkin:** Combinatorial and discrete geometry, axiomatic geometry, finite geometries, geometry of finite-dimensional Normed Spaces, geometric shortest networks such as Steiner Minimal Trees and the Fermat-Torricelli Problem, extremal combinatorics.



**Professor Bernhard von Stengel:** Game theory (efficient computation of equilibria, theory of online algorithms), extensive form games, correlated equilibria, pivoting algorithms in linear programming and linear complementarity problems, polytope theory.

**Dr Konrad Swanepoel:** Combinatorial and discrete geometry, axiomatic geometry, finite geometries, geometry of finite-dimensional normed spaces, geometric shortest networks, such as Steiner minimal trees and the Fermat-Torricelli problem, extremal combinatorics.

**Dr László Végh:** Combinatorial optimisation related to connectivity, flows, matchings and matroids, and also applications to areas such as mathematical economics, algorithmic game theory and network design.

**Dr Luitgard Veraart:** Financial mathematics, particularly, optimal investment problems, stochastic volatility models, pricing of derivatives, risk management in financial markets.

**Dr Giacomo Zambelli:** Combinatorial optimisation; integer programming; mathematical programming; operations research

**Professor Mihail Zervos:** Stochastic analysis, stochastic control and optimisation, optimal stopping problems, valuation of investment decisions and investments in real options, options of American type, derivative pricing in incomplete markets, weather derivatives.

## Staff Office Hours

Members of academic staff have regular office hours during term time. These are the times when they are available to be seen in their offices. Office hours are normally posted on their office doors and on the departmental web site at [www.lse.ac.uk/math/Courses/Office\\_Hours.aspx](http://www.lse.ac.uk/math/Courses/Office_Hours.aspx)

## Departmental Office, room COL 4.01

Rebecca Batey, Jackie Everid, Enfale Farooq, Rebecca Lumb and Kate Barker work together to provide the administrative support for the Mathematics Department. Their room numbers, telephone numbers and email addresses are on page 4.

In the Departmental Office you will find:

**Rebecca Batey** ([r.batey@lse.ac.uk](mailto:r.batey@lse.ac.uk))

MSc Programme Manager

**Jackie Everid** ([j.l.everid@lse.ac.uk](mailto:j.l.everid@lse.ac.uk))

Undergraduate Course Co-ordinator.

**Enfale Farooq** ([e.farooq@lse.ac.uk](mailto:e.farooq@lse.ac.uk))

Departmental Administrator

The Departmental Office is usually open for enquiries between 10.00–12.00 and 14.00–16.00 during term time. All non-academic enquiries should be directed here. You can contact the office via email or telephone. The email address [maths.info@lse.ac.uk](mailto:maths.info@lse.ac.uk) reaches all 5 administrative staff. The telephone number of the Departmental Office is 020 7955 7925.

## Information on Studying and Support

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### Your Academic Adviser

Each student on the MSc is assigned one of the academic members of the Department as an Academic Adviser. You can consult your adviser if you have any difficulties with your studies. Your adviser can also be a first contact in case of personal problems. All advisers have regular office hours, see

[www.lse.ac.uk/maths/Courses/Office\\_Hours.aspx](http://www.lse.ac.uk/maths/Courses/Office_Hours.aspx)

During Orientation, at the beginning of the academic year, you must see your adviser to discuss and agree your choice of courses. After this initial meeting, you should arrange to see your adviser at least once in each term.

Your adviser is likely to be one of the people who will write reference letters for you in the future, so it is important that they get to know you well. Furthermore, your adviser is your first point of contact with the School should anything go wrong. So let your adviser know about any changes in your situation. In particular, inform them if you miss teaching for any long period because of illness, family circumstances, or anything else.

Academic Advisers are expected to treat all information with the appropriate level of confidentiality. However, sometimes it may be necessary for your adviser to discuss your situation with, e.g., the Programme Director, or some of your lecturers. If you are worried about how the information will be used or who has access to it, discuss this with your adviser.

Note that your Academic Adviser is not responsible for administrative issues. If something is wrong with your registration, timetable, etc., you should contact the **Student Services Centre** or contact the MSc Administrator in the Departmental Office (COL 4.01).

### Programme Director

The Programme Director is in overall charge of the advising system, and has a special responsibility for monitoring the progress of students. He also has to approve all course choices, and any special arrangements. In most cases you should consult your Academic Adviser before seeing the Programme Director.

If you have difficulties communicating with your Academic Adviser, you can contact the Programme Director to discuss the situation. In exceptional circumstances, where you feel the Programme Director is unable to help, you are

welcome to instead contact the Head of Department, **Professor Martin Anthony**, or even LSE's Dean of Graduate Studies.

This year the Programme Director is **Dr Peter Allen**. He is available to be seen during regular consultation sessions. Appointments can be made by emailing him.

### Your Dissertation Supervisor

Later in the year, all students in the MSc will be assigned a Dissertation Supervisor. Many members of the academic staff are available for dissertation supervision, and offer dissertation topics that they are willing to supervise. They will speak about these in the Dissertation Seminar MA498 and you can also discuss topics with them directly. The academic member of staff who agrees to supervise your dissertation on a particular topic becomes your Dissertation Supervisor. (You will continue to have your Academic Adviser too.) Please note that each supervisor will only be able to supervise a limited number of students.

### Staff Student Liaison Committee (SSLC)

At the start of the year you will be asked if you would like to represent your programme on the Staff Student Liaison Committee. This is an important Committee as it provides a forum for feedback from students on their programme and for discussion of issues which affect the student community as a whole. The role of an SSLC representative is therefore central to effective quality assurance of courses and programmes in the School and those elected or chosen as a representative will be given training.

Membership of SSLCs includes student representatives from each programme of study and appropriate academic staff. There is normally one representative for each year of each programme, although this can vary depending on the number of students in the Department or Institute.

The SSLC also elects one representative to attend the relevant School level Students' Consultative Forum. More information on the Consultative Forum can be found by following the link: [www.lse.ac.uk/studentRepresentation/home.aspx](http://www.lse.ac.uk/studentRepresentation/home.aspx)



## Lectures, classes and coursework

Courses in Mathematics are taught by means of lectures and classes or seminars. For each course, there are usually two lectures per week during the two main teaching terms (most half unit courses run for one term, or ten weeks, of teaching).

For each course, you will also be assigned to a class or seminar, meeting once a week, and presided over by a class teacher. This teacher will often, but not always, be the same person as the lecturer for the course. Classes normally start in week 2 or 3 of the term. Timetables can be viewed on the web at [www.lse.ac.uk/timetables](http://www.lse.ac.uk/timetables) and you will be able to see your personal timetable on LSE for You. Teaching arrangements on courses run by other departments may be different.

Many courses will assign coursework during the term; in Mathematics courses this is usually in the form of weekly exercise sheets, but in other Departments there may be different arrangements. You will be invited to hand in this coursework, so that it can be graded by the class teacher.

The grades assigned for regular coursework do not count in any way towards your degree. However, some courses contain an element of 'assessed coursework' that does count towards your degree. In addition, doing the assigned work for a course regularly is some of the best preparation you can get for the exams at the end of the year, and is an excellent means of getting feedback on your progress.

## Study material

Each course will have its own requirements in terms of the study materials (books, notes, etc.) students need. You can find reading lists in the Calendar entry for each course. But in general you should wait until the first lecture of a course before buying any books or other study material for that course.

Most mathematics courses make extensive use of notes written by the lecturer(s). These may be handed out in the lectures. Usually they will be available via the course material page on Moodle as well. If you need or want to buy books, you can do so anywhere you want. There is, however, an on-campus bookshop, the *Waterstone's Economists' Bookshop*, see [www.lse.ac.uk/intranet/LSEServices/services/waterstones/Home.aspx](http://www.lse.ac.uk/intranet/LSEServices/services/waterstones/Home.aspx).

## Postgraduate study room (COL.2.05E)

The Department of Mathematics has a study room that is available to you. This room is **COL.2.05E**, on the 2<sup>nd</sup> floor of Columbia House, and is available 0700-0000; weekends 0800-2200) You will need your ID card for access to the building and the 2<sup>nd</sup> floor. The Department and the School cannot take responsibility for stolen or damaged items.

## Student study advice

The LSE Teaching and Learning Centre offers study advice, with specialist provision for undergraduate and taught Masters students. There is a series of lectures and workshops throughout the academic year covering essay writing, time management, preparing for exams, dealing with stress, etc. A limited number of one-to-one appointments can also be booked with a study adviser to discuss strategies for quantitative/qualitative subjects or with the Royal Literary Fund Fellow to improve writing style. Email [studentsupport@lse.ac.uk](mailto:studentsupport@lse.ac.uk) for further details.

## Guide to useful LSE Websites

**Please note that throughout this Handbook we give links to important information rather than reproducing it in full here. This is because the online versions of the documents referred to are likely to be more up-to-date.**

### Departmental website

[www.lse.ac.uk/maths](http://www.lse.ac.uk/maths)

This is the website of the Mathematics Department. It is one of the main sources of information about the Department and its courses. Check the website regularly, as it is constantly updated.

### LSE Calendar

[www.lse.ac.uk/calendar](http://www.lse.ac.uk/calendar)

The purpose of the Calendar is to gather together all regulations relating to students and their study within a single resource. Full details of degree regulations, exam arrangements, guides to all courses, etc., can be found in the Calendar, which is published on the LSE website for use by the LSE staff and students.

The following guidelines and documents in the [Calendar](#) website contain information that you are likely to find useful throughout your study:

- [Regulations for Taught Masters Degrees for students](#)
- [Your Programme of Study – Taught Masters Degree](#)
- [Code of Good Practice for Taught Masters Programmes: Teaching, Learning and Assessment](#)
- [Examination appeals](#)
- [Regulations on assessment offences: offences other than plagiarism](#)
- [Statement on editorial help for students' written work: guidance for students, supervisors and examiners](#)

and the following web link gives you an a-z list of relevant regulatory documents where you can find further details of all School Regulations.

- [www.lse.ac.uk/intranet/staff/schoolRegulations/atoz.aspx](http://www.lse.ac.uk/intranet/staff/schoolRegulations/atoz.aspx)

### LSE for You

LSE for You (LFY) is a personalised web portal which gives you access to a range of services. For example, you can:

- view or change your personal details
- reset your Library and network passwords
- monitor and pay your tuition fees online
- check your exam results

You can also access online tutorials on how to navigate and personalise LFY via its login page. Use your LSE network username and password to login via [lse.ac.uk/lseforyou](http://lse.ac.uk/lseforyou).

**Please keep your personal details up to date on LFY so that we can contact you if necessary.**

### Moodle

Moodle is LSE's Virtual Learning Environment (VLE). Moodle is a password-protected web environment that may contain a range of teaching resources, activities, assignments, information and discussions relating to your course. The content of Moodle is the responsibility of your teacher and so it will vary from course to course: not all teachers choose to use Moodle.

Moodle can be accessed from any computer connected to the internet, on and off campus. To access Moodle go to [moodle.lse.ac.uk](http://moodle.lse.ac.uk) and use your LSE username and password to login. This page also has links to help and advice on using Moodle.

You will also find links to Moodle from a number of web pages including the webpage for 'Staff & Students' on the main School web page. If you have any technical problems with Moodle you should contact the IT helpdesk at [it.helpdesk@lse.ac.uk](mailto:it.helpdesk@lse.ac.uk).

### Timetables

[www.lse.ac.uk/timetables](http://www.lse.ac.uk/timetables)

The Timetables Office is responsible for scheduling and allocating rooms to all of the School's taught courses. The Timetables web page includes information for students and staff.

### Graduate Personal Timetables

You use LFY to select your courses and seminar groups. Personal Timetables can then be viewed in LSE For You.

Seminar registration for postgraduate students is co-ordinated by the department teaching the course; therefore please contact them directly with any queries.

For more information please see:  
[lse.ac.uk/programmeregistration](http://lse.ac.uk/programmeregistration)

## Email

The School will use your LSE email address to communicate with you so you should check it regularly. We recommend that you develop a filing system, frequently deleting and archiving mail to ensure you stay within your email

storage limit. The email program, Microsoft Outlook, is available on all student PCs on the LSE network. You can also access e-mail off-campus using webmail and remote desktop or, on the move using email clients for laptops and mobile phones. For instructions on how to do this visit [www.lse.ac.uk/IMT/remote/](http://www.lse.ac.uk/IMT/remote/)

**Do check your email at  
your LSE address frequently!**

## MSc in Applicable Mathematics Degree Regulations

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*Full year programme. Students are required to take courses to the value of four full units.*  
All courses are half-unit except where stated.

**1. One course from:**

- MA407 Algorithms and Computation
- MA421 Advanced Algorithms

**2+3+4. Three courses from:**

- MA402 Game Theory I\*
- MA408 Discrete Mathematics and Graph Theory
- MA409 Continuous-Time Optimisation
- MA410 Information, Communication and Cryptography
- MA411 Probability and Measure
- MA412 Functional Analysis and its Applications
- MA413 Games of Incomplete Information
- MA414 Stochastic Analysis
- MA420 Quantifying Risk Modelling and Alternative Markets
- MA421 Advanced Algorithms (if not taken under Paper 1)

**5+6. Courses to the value of two half-units from:**

- EC484 Econometric Analysis (full unit)\*\*
- EC487 Advanced Microeconomics (full unit)\*\*
- FM402 Financial Risk Analysis
- FM441 Derivatives
- FM442 Quantitative Methods for Finance and Risk Analysis\*\*\*
- FM492 Principles of Finance (full unit)\*\*\*\*
- GV4A3 Social Choice Theory and Democracy
- MG4A7 Efficient Algorithms For Hard Optimisation Problems
- MG4C1 Techniques of Operational Research
- MG4C5 Modelling in Applied Statistics and Simulation
- MG4C6 Mathematical Programming: Theory and Algorithms
- MG408 Combinatorial Optimization
- MG409 Auctions and Game Theory
- MG4C5 Computer Modelling: Applied Statistics & Stimulation
- MG4C8 Model Building in Mathematical Programming
- MG4E1 Algorithms Techniques for Data Mining
- ST409 Stochastic Processes
- ST418 Non-Linear Dynamics and the Analysis of Real Time Series
- ST422 Time Series

*Another half-unit from the list at 2/3/4 above, or any other paper with the approval of the Programme Director and the teacher responsible for the course*

**7. MA498 Dissertation in Mathematics (full unit equivalent)**

**Notes:**

- \* This option will not be available to those who have already studied MA300 and MA301 or who have studied this subject as part of an undergraduate degree.
- \*\* These options will only be available to those that took the pre-session course EC451
- \*\*\* Students taking this course can apply for a place on FM457 for MSc Students, a non-assessed computer course.
- \*\*\*\* Students must seek permission from the Department of Finance to take this course. They will be required to complete an online form about their background in mathematics, statistics and economics. The forms will be reviewed and approved or rejected, or a student may be asked to provide more information.

**Scheme for the Award of a Taught Masters Degree**

You can find detailed information concerning the School's *Scheme for the Award of a Taught Masters Degree (four units)* on the LSE Calendar website at the following link:

<http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/SchemeTaughtMasters.pdf>

This clearly sets out the School's procedure for awarding a taught Master's degree. It includes important information such as the different pass/fail marks for all courses run by the various Departments along with details about how a final degree classification is awarded.

## Provisional Lectures Timetable MSc Applicable Mathematics 2015/16

Compulsory courses	
MA498 Dissertation in Mathematics (full unit equivalent)	
MA407 Algorithms and Computation OR	
MA421 Advanced Algorithms	
Options	
MA402 Game Theory I	
	MA408 Discrete Mathematics and Graph Theory
	MA409 Continuous-Time Optimisation
MA410 Information, Communication and Cryptography	
MA411 Probability and Measure	
MA412 Functional Analysis and its Applications	
	MA413 Games of Incomplete Information
	MA414 Stochastic Analysis
	MA420 Quantifying Risk and Modelling Alternative Markets
	MA421 Advanced Algorithms
EC484 Econometric Analysis (full unit)	
EC487 Advanced Microeconomics (full unit)	
FM402 Financial Risk Analysis	
	FM441 Derivatives
FM442 Quantitative Methods for Finance and Risk Analysis	
FM492 Principles of Finance (full unit)	
	GV4A3 Social Choice Theory and Democracy
	MG4A7 Efficient Algorithms For Hard Optimisation
	MG4C1 Techniques of Operational Research
	MG4C6 Mathematical Programming: Theory and Algorithms
	MG4E1 Algorithms Techniques for Data Mining
	MG408 Combinatorial Optimisation
MG4C5 Computer Modelling: Applied Statistics & Stimulation	MG409 Auctions and Game Theory
MG4C8 Model Building in Mathematical Programming	
ST409 Stochastic Processes	
	ST418 Nonlinear Dynamics and the Analysis of Real Time Series
ST422 Time Series	

Details about timetables can be found on the School's website at: [www.lse.ac.uk/timetables/](http://www.lse.ac.uk/timetables/)

The timetable above covers lectures only. Class and seminar timetables will not be available until the first or second week of term.

LSE refers to the Autumn Term as *Michaelmas Term*; this covers the period from the start of formal teaching until the Christmas vacation (October-December). The period of teaching from Christmas to Easter (January-March) is referred to as *Lent Term*. The period from Easter until the summer vacation is called *Summer Term*; exams take place during this time and teaching is restricted to a small number of revision lectures on each course.

## Information about Mathematics courses

### Choosing your courses

There are many places where you can get information about the content of the courses available in order to help you decide which ones will best suit your personal requirements. The official course guides can be found online in the LSE Calendar, [www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm](http://www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm)

Most Departments have more information available via their websites, or on Moodle. If you want an even better idea about a particular course, or about whether it really fits your interests, you could contact the teacher responsible for the particular course. That may mean spending some extra time when selecting your courses, but this is usually worth it. Most lecturers will use the first lecture of their course to give an introduction and general overview. For Mathematics courses in particular, the following applies: All lecturers for courses that start in the Michaelmas Term will give an introduction in the first lecture of their course; for courses that don't start until the Lent Term, lecturers will give short presentations at the first Dissertation Seminar (**MA498**) on Thursday **29 September**, 16.00-18.00.

Once you have decided what courses to take, you should enter your selection online via LSE for You, [lfy.lse.ac.uk](http://lfy.lse.ac.uk). Your selection will need the approval of your Academic Adviser. If you want to choose a course outside those listed in the regulations for your degree, you will also need the approval of the MSc Programme Director. Until your choices have been approved, you won't be officially registered for a course, and you won't be assigned a class for the course.

### Postgraduate seminar sign up

You will need to choose all of your courses, including any compulsory ones and your dissertation, in LSE for You.

Course choice opens for browsing during Welcome Week so that you can get used to the system however you will not be able to make any choices during this period. The system opens fully from **23<sup>rd</sup> September 2016** but you will only be able to access the 'Graduate Course Choice' option in LSE for You when your admissions paperwork is completed. The deadline for course choices for postgraduate

students is **10<sup>th</sup> October 2016**. The system will re-open at the beginning of Lent Term so you can make any changes that are needed for Lent Term.

To choose your courses first visit [lse.ac.uk/coursechoice](http://lse.ac.uk/coursechoice). Here you will find links to the programme regulations which outline your available course choices and a course guide for each of them. You will also find tutorials on how to use the Graduate Course Choice system.

Many courses have 'controlled access' and you will need to apply to the department teaching the course for permission to take it before you can select it. If such an application is required, it will be indicated in the system. You can make applications to take these courses within the system. Your overall diet of courses is also subject to the approval of your home department.

Some departments allocate places to seminars centrally whilst others permit you to choose using the seminar signup facility in LSE for You.

Personal timetables can then be viewed in LSE for You.

The **Department of Finance** will be holding its **Graduate FM Optional Courses Orientation Session** on Wednesday 21 September from 13:00 – 17:00 in the Peacock Theatre. This is the meeting where course leaders will present FM optional courses to students.

**Be aware that course choices must have been made by the start of week 3 (Monday 10<sup>th</sup> October, 12noon)!**



## Course guides

In this section you will find some information about the Courses for the MSc provided by the Mathematics Department. Official information can be found on the School's Calendar website via

[www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm](http://www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm) .

Faculty from the Department have prepared short films to give you more information about the courses available to you. Please note that the lecturers who recorded these films may not be the lecturer delivering the course each year. The films can be found on the MSc Mathematics Moodle page at the following link:

<http://www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm>

### MA402 Game Theory I

Teacher responsible: **Dr Paul Dütting**

Game theory studies formal models of conflict and cooperation. The theory started with questions on how to play optimally in chess or poker. The resulting mathematical approaches have been further developed such that they now form a cornerstone of mathematical economics.

MA402 is an introduction to game theory. At the end of this half-unit course, the student should be familiar with the main concepts of non-cooperative game theory, and know how they are used in modelling and analysing an interactive situation.

The key concept is that players should act strategically. This means that playing well does not mean being smarter than the rest, but assuming that everybody else is also 'rational' (acting out of self-interest). The game theorist's recommendation how to play must therefore be such that everybody would follow it. This is captured by the central concept of Nash equilibrium. Furthermore, it can be useful to randomize. In antagonistic situations, a player may play best by rolling a die that decides what to do next. In poker, for example, it may be useful to bet occasionally high even on a weak hand ('to bluff') so that one's opponent will take the bet even if one has a strong hand.

A prerequisite is basic familiarity with calculus, linear algebra and probability. For a mathematical solution to a certain game, Nim, the student should know the binary system (the base 2 number system), e.g. that 1001 in binary is 9 in decimal. The course is mathematical, and theorems will be stated and proved. Nash equilibria with randomised strategies will be described geometrically,

which is best understood when knowing the geometry of vectors.

### MA407 Algorithms and Computation

Teacher responsible: **Dr Julia Böttcher**

The course aims to provide an introduction to the theory of algorithms, data structures, and computational complexity. Algorithms are the methods by which a computer performs certain tasks. The design of algorithms goes hand in hand with the design of data structures, which define how data are organised.

Experience from previous years' shows that algorithms are best understood by writing computer code. For that purpose, programming exercises will be done in the programming language Java. This will include a project that accounts for 25% of the final course grade.

There are no formal pre-requisites, but this is a fairly abstract course. In particular proving the correctness of algorithms and analysing their running time are important topics of the course. Moreover algorithmic problems often concern discrete structures, like integer numbers or trees. It is therefore helpful if students are familiar with the fundamental concepts of discrete mathematics. Having done some computer programming is not mandatory. The course will give an introduction to programming at a rapid pace. Computer resources for programming will be provided.

At the end of the course, the student should know basic data structures and their role in solving programming tasks. The student should also be able to design correct and efficient algorithms, to describe their steps precisely and understandably, and to code them in simple programming contexts.

### MA408 Discrete Mathematics and Graph Theory

Teacher responsible: **Dr Peter Allen**

Discrete Mathematics is the area of mathematics dealing with finite sets and structures, such as graphs and networks. It utilises a rich array of techniques, and addresses a wide variety of problems that arise in everyday life, such as how to find the best route from one city to another, how to count the number of different combinations of toppings for pizzas, how best to schedule a list of tasks to be done, and how computers store and retrieve arrangements of information on a screen. Discrete mathematics is the mathematics used by decision-makers in our society, from workers in government to those in health care, transportation, and telecommunications.

This course aims to give an idea of some of the main ideas studied in the broad area that is

Discrete Mathematics, where the emphasis will be on subjects that have clear algorithmic aspects.

### **MA409 Continuous-Time Optimisation**

Teacher responsible: **Professor Adam Ostaszewski**

This is a high-level methods course centred on the establishment of a calculus appropriate to optimization problems in which the variable quantity is a function or curve. Such a curve might describe the evolution over continuous time of the state of a dynamical system. This is typical of models of consumption or production in economics and financial mathematics (and for models in many other disciplines such as engineering and physics). We will be studying two contexts. In the first the future state of the modelled environment is predetermined by the equations describing the model. In the second context we introduce and model uncertainty by using a mathematical device known as Brownian Motion to generate uncertainty. The emphasis of the course is on calculations, but there will also be some theory.

### **MA410 Information, Communication and Cryptography**

Teacher responsible: **Dr Andrew Lewis-Pye**

This course provides an introduction, for students with a mathematical background, to information theory, coding theory, cryptography, and related areas. These areas have been the subject of significant advances during the last 50 years, beginning with the fundamental work of Shannon. He provided good definitions of such things as 'information content' and 'channel capacity', leading to the formulation of precise mathematical statements. Nowadays these ideas provide a framework for serious discussion of practical aspects of communication, such as data compression, coding, and cryptography.

In coding theory, the aim is to construct systems that will overcome random error produced by 'noise' in the system. On the other hand, in cryptography we seek to transform a message into a form that can only be understood by the intended recipient. Not surprisingly, absolute security is unobtainable in practice, and so we are led to introduce the notion of complexity.

The intention is that it will be relatively easy for the intended recipient to understand the message, but very hard for anyone else to do so.

### **MA411 Probability and Measure**

Teacher responsible: **Dr Pavel Gapeev**

The mathematical theory of probability can be used for modelling a number of real-world phenomena which are perceived as random, for instance games of chance, the evolution of prices, the performance of telephone networks, temperature etc. The aim of this course is to explain the foundations of rigorous probability theory, and the course starts with fundamental concepts such as probability spaces and probability measures, random variables and expectation. Equipped with a background in measure theory, the course goes on to explore various classical results like the monotone and dominated convergence theorem, and selected topics in related to stochastic processes like martingales and stopping times. The course is a rigorous proofs based course, and should provide a good background for more advanced courses in mathematical economics and finance.

### **MA412 Functional Analysis and its Applications**

Teacher responsible: **Dr Robert Simon**

Functional analysis plays an important role in the applied sciences as well as in mathematics itself. This course aims at familiarising the student with the basic concepts, principles and methods of functional analysis and its applications. Methods of functional analysis find wide applicability in diverse problems arising in the applied sciences.

Roughly speaking, functional analysis develops the tools from calculus and linear algebra further to the more general setting where one has vector spaces comprising functions, or general vector spaces that are infinite-dimensional.

Problems from various application areas can then be conveniently posed in this common general set up, and solved using the techniques of functional analysis. The basic objects studied in functional analysis are vector spaces with a notion of distance between vectors, and continuous maps between such vector spaces. This interplay between the algebraic and analytic setting gives rise to many interesting and useful results, which have a wide range of applicability to diverse mathematical problems, such as from differential and integral equations, numerical analysis, optimization and approximation theory.

### **MA413 Games of Incomplete Information**

Teacher responsible: **Dr Robert Simon**

Mathematical Game Theory has progressed rapidly in the last three decades. The techniques and results of game theory are increasingly important to economic analysis. This course is designed as an introduction to two branches of rapid growth in mathematical game theory: the theory of asymmetric information in repeated games, and Bayesian games (for example card games). For the former, we investigate the conditions sufficient for there being an equilibrium and also how incomplete information influences the payoffs of the players. We show how the dilemmas of moral hazard can be circumvented through stochastic signalling. For the latter we look how the information structure influences the behaviour in equilibrium, including a demonstration that the equilibria of card games can be extremely complex.

### **MA414 Stochastic Analysis**

Teacher responsible: **Dr Arne Lokka**

Stochastic analysis is a branch of probability dealing with calculus in the presence of randomness. In particular this involves integration of stochastic processes with respect to stochastic processes. Stochastic analysis is used to model and analyse systems that behave randomly in time, and applications can be found in a variety of areas such as physics, biochemistry, ecology and finance.

The main focus of this course will be on Brownian motion and stochastic models based on Brownian motion. The course starts by proving existence and uniqueness for Brownian motion and some key results related to its properties. The course will then focus on stochastic differential equations driven by Brownian motion, their properties, existence and uniqueness.

### **MA420 Quantifying Risk and Modelling Alternative Markets**

Teacher responsible: **Prof Mihail Zervos**

This course is concerned with various issues arising in the context of investment risk specification as well as with the mathematical theory of so-called alternative markets, such as commodity and energy markets. In particular, the course considers the structural credit risk models and the quantification of risk by means of copulas and risk measures. Also, the course expands on the modelling of alternative markets and addresses the problem of valuation of investments in real assets.

### **MA421 Advanced Algorithms**

Teacher responsible: **Dr Tugkan Batu**

This course covers some advanced topics in the design and analysis of algorithms, studying different models, tools, and techniques commonly used. First, we will introduce some concepts related to computational intractability and a large class of computationally hard problems. We will then study some mechanisms for coping with various aspects of computational hardness, including algorithmic models that produce solutions for optimisation problems with near-optimality guarantees, those that incorporate randomness to obtain efficient methods, and those that are designed to process large number of data items in a restricted sequential manner. We will also study algorithms for various numerical processing problems.

### **MA498 Dissertation in Mathematics**

Teacher responsible: **Dr Peter Allen and other members of the Mathematics Department**

In these seminars, potential supervisors will describe the projects that they are willing to supervise, and answer questions about them. We will also have talks by experts on various aspects of dissertation writing such as library research, mathematical word processing and mathematical writing. There will be time for students to confer individually with the teacher responsible for the course about their choice of project.

## Assessment

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This section is concerned with the various forms of assessment that you might encounter during your studies for the MSc. You should also consult the School's advice on assessment, which you can find on the School's website via [www.lse.ac.uk/resources/calendar/taughtMasters.htm](http://www.lse.ac.uk/resources/calendar/taughtMasters.htm), in particular

- Sections 4.1–4.5 of the Code of Good Practice for Taught Master's Programmes: Teaching Learning and Assessment  
<http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/CodeOfGoodPracticeTaughtMasters.pdf> and
- the Regulations for Taught Masters degrees  
[http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters\\_InOrAfter2009-10.pdf](http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters_InOrAfter2009-10.pdf)

'Informal' assessment, which does not count towards your final results, takes place on all courses. It is referred to as 'Formative coursework' in the Course Guides in the Calendar. In Mathematics courses this will usually take the form of weekly 'exercises', which will be marked and returned to you. The main purpose of this is simply to give you feedback on how well you are dealing with the material, and what you can improve on.

'Formal' assessment, which does count towards your final results (and is sometimes known as 'summative' assessment), can take several different formats. Virtually all MSc courses are primarily assessed by an unseen written exam in the Summer Term. A half unit course is usually assessed by a two-hour exam and a full unit course by a three-hour exam, although there is some variety to this.

A number of courses, including the compulsory course MA407 Algorithms and Computation and MA421 Advanced Algorithms, include assessed coursework as part of the final assessment, in addition to the exam. Assessed coursework may come in a variety of formats, and you are advised to check the course guide for each course to see what format the assessment will take. Further guidance on assessed coursework is provided below.

As you will be aware, there is a compulsory dissertation unit on the MSc in Applicable Mathematics. This has the value of a full unit. Further information on the Dissertation in Mathematics is provided on pages **20–22** of this Handbook. We will also provide you with a lot more guidance in the Dissertation Seminars MA498.

### Assessed Coursework

In some courses you will be set one or more coursework or project assignments as part of the formal assessment. Information on what courses this applies to can be found by looking at the information on 'Assessment' given in the official course guides at the School's Calendar website [www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm](http://www.lse.ac.uk/resources/calendar/courseGuides/graduate.htm). In general, the lecturer responsible for the course will tell you, towards the beginning of teaching, the nature of any assessed coursework, when the coursework will be set, and the due date for submission of the work.

Assessed coursework is marked according to the same strict procedures as the formal written examinations in Summer Term and so involves a second Examiner and the Department's External Examiner. The marking of assessed coursework is done anonymously. This means that coursework must be handed in formally to the Mathematics Departmental Office and not to the lecturer for the course. You will be required by the Office to complete a frontsheet for each piece of coursework you are handing in. The office will pass on your work identified only by your Examination Candidate Number. Therefore, please remember not to write your name or student ID number on any piece of assessed coursework you are submitting, only your Examination Candidate Number. The Departmental Office will however keep a record of Candidate Numbers and names to ensure that proper record is kept of the submission of coursework.

Please be aware that the *Penalties for late Submission of Coursework* will apply to all assessed coursework. These can be found on the LSE Calendar online at [http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters\\_InOrAfter2009-10.pdf](http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters_InOrAfter2009-10.pdf)

Feedback on assessed coursework will be given within three weeks of the submission deadline.

Please also note that, as with the dissertation, you will be asked to sign a declaration that the coursework submitted is entirely your own. This declaration is known officially as a *Plagiarism Statement*. Further information on plagiarism is given on page 21 of this Handbook.

## Assessment Criteria - Examinations

Most of the courses you will take as part of your degree will be in mathematics. Other subjects have their own traditions and arrangements for assessment, and students are directed to the appropriate departments to find more about these. Mathematics courses at LSE are assessed primarily by means of written, unseen, closed-book examinations, although occasionally some courses include a specified amount of assessed coursework. The Mathematics department has the following general guidelines on assessment criteria, which provides broad descriptions of the meaning of marks awarded on our examinations (See Table on following page).

## Assessment Criteria - Coursework

There are specific assessment criteria for dissertations and extended pieces of assessed coursework.

Smaller pieces of assessed coursework are likely to resemble homework exercises in style and nature, and one purpose of the marking and grading of homework exercises earlier in the course is to inform students about what is expected from them in assessed coursework (and also in examinations).

Coursework will be assessed on accuracy and understanding of the material. It is LSE policy that students should be given some feedback on assessed coursework; this will often be in the nature of "collective feedback", i.e., indications of common errors and parts of questions that were answered particularly well or badly. The exact format of such feedback is at the discretion of the lecturer of the course.

Further information can also be found at the following link:

[www.lse.ac.uk/maths/Courses/Exam\\_guidance.aspx](http://www.lse.ac.uk/maths/Courses/Exam_guidance.aspx)

## Feedback

### What is feedback?

- It is part of learning – providing you with ideas and information about how to improve your work.
- It is a dialogue – between you and all those other people you come across in your learning who help you develop and understand ideas.
- It is a joint responsibility – you need to be an active player, not a passive recipient!

### How can feedback help you?

- It helps you improve the particular assignment you are working on.
- It gives you useful pointers for subsequent work.

- It helps you understand the criteria that will be used to assess you in essays and exams where the grade counts towards your degree result.
- It motivates you to reach your potential.

### How is feedback provided?

#### Solutions to problem sets

The main source of feedback in your courses will come in the form of marks and corrections on your solutions to problem sets – your lecturers will not just say where something is wrong, but also try to identify where you need to correct your understanding of a concept, or how your attempt at a solution could be made to work. Of course, you will only get this feedback if you regularly hand in work.

#### From Lecturers / class teachers

Another important source of feedback is asking questions of your lecturers and / or class teachers. They will be happy to have questions, in lectures or in classes or in office hours. Remember: if you do not understand something, you are probably not alone. Your fellow students will appreciate it if someone is brave enough to ask why that statement on the board is true! Furthermore, office hours are provided for your benefit. Your lecturer does not, by definition, have anything better to do during their office hours than to answer your questions, even if you are worried they might be 'silly': the only silly thing is not to ask a question, since then you won't learn.

#### Fellow students

You can also get feedback from your fellow students, by working together to understand the lecture notes or to solve the weekly problem sets.

#### Group work

Group work, in which all participants are actively trying to contribute ideas and solve problems, is an excellent way to learn.

#### Dissertation supervisor

Finally, when you write your dissertation you should be in close contact with your dissertation supervisor. They will give you feedback on your early reports, on your ideas of how to write the dissertation, and on the draft you produce. They will be especially happy if you ask specific questions about how to improve your work. This is your opportunity to learn how to write a long report on a difficult topic professionally: make the most of it.

### Making feedback work for you ([PDF](#))

<http://www.lse.ac.uk/intranet/LSEServices/TLC/Resources/home.aspx>

## Assessment Criteria - Examinations

Mark (%)	Grade descriptor	Characteristics
0-9	Bad Fail	<ul style="list-style-type: none"> <li>Nothing presented or completely incorrect information or answers contain nothing at all of relevance.</li> <li>No evidence of understanding.</li> <li>No competence in core basic techniques of the subject.</li> </ul>
10-19	Bad Fail	<ul style="list-style-type: none"> <li>Very little information or information that is almost entirely incorrect or irrelevant.</li> <li>Very little evidence of understanding.</li> <li>Very little competence in core basic techniques of the subject.</li> </ul>
20-29	Fail	<ul style="list-style-type: none"> <li>Little understanding evident.</li> <li>Very limited competence in core basic techniques of the subject.</li> </ul>
30-39	Fail	<ul style="list-style-type: none"> <li>Some understanding evident, but no ability to grapple with anything other than limited range of very routine questions.</li> <li>Limited competence in core basic techniques of the subject or competence only in a small part of the material.</li> </ul>
40-49	Fail	<ul style="list-style-type: none"> <li>Not more than basic understanding and competence in the subject, with no ability to grapple with anything other than very routine questions.</li> <li>Not more than basic competence in core basic techniques of the subject or competence only in a limited part of the material.</li> <li>A basic range of information and knowledge deployed, with areas of inaccuracy.</li> </ul>
50-59	Pass	<ul style="list-style-type: none"> <li>An acceptable demonstration of a basic understanding of, and competence, in the subject.</li> <li>Knowledge of, and application of, relevant methods and techniques.</li> <li>A range of information and knowledge deployed, with a few possible areas of inaccuracy.</li> </ul>
60-69	Merit	<ul style="list-style-type: none"> <li>A clear understanding of the subject.</li> <li>Competent application of relevant methods and techniques.</li> <li>Wide and accurate range of information and knowledge deployed.</li> <li>Some capacity to solve more unusual or demanding questions involving application of significant understanding of the subject.</li> <li>May demonstrate ability to grapple with standard problems but limited capacity to solve more unusual or demanding questions involving application of significant understanding of the subject.</li> </ul>
70-79	Distinction	<ul style="list-style-type: none"> <li>A thorough understanding of the subject.</li> <li>Deft application of relevant methods and techniques.</li> <li>Extensive range and consistent accuracy of information and knowledge.</li> <li>A significant capacity to solve more unusual or demanding questions involving application of thorough understanding of the subject and its methods.</li> </ul>
80-89	Distinction	<ul style="list-style-type: none"> <li>A deep understanding of the subject.</li> <li>Mastery of relevant methods and techniques.</li> <li>Highly extensive range and consistent accuracy of information and knowledge.</li> <li>An impressive ability to solve more unusual or demanding questions involving application of deep understanding of the subject and its methods.</li> </ul>
90-100	Distinction	<ul style="list-style-type: none"> <li>A comprehensive and deep understanding of the subject.</li> <li>Mastery of relevant methods and techniques and an ability to deploy them with flair.</li> <li>Very extensive range and consistent accuracy of information and knowledge.</li> <li>An outstanding ability to solve unusual and demanding questions involving application of deep and comprehensive understanding of the subject and its methods.</li> </ul>

Those unfamiliar with the UK system might also find the information here to be useful:

[www.lse.ac.uk/maths/Courses/Exam\\_guidance.aspx](http://www.lse.ac.uk/maths/Courses/Exam_guidance.aspx). Also informative is the national 'QAA Subject Benchmark Statement for Mathematics, Statistics and Operational Research', available at <http://www.qaa.ac.uk/en/Publications/Documents/SBS-Mathematics-15.pdf>, whilst primarily aimed at undergraduate courses – these set out the expectations for any undergraduate degree course in the UK in these subjects – much of what they say will also apply at graduate level.



## The Dissertation in Mathematics

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This section describes the role the dissertation plays in our assessment of your progress on the MSc programme. More detailed information about preparing for a Dissertation in Mathematics will be provided during the Dissertation Seminars MA498.

### The purpose of a dissertation

The dissertation is an important opportunity to study in depth a topic of specific interest to you, and for you to apply knowledge and skills gained during the taught part of the MSc programme. The academic staff in the Department will produce a list of topics which they are willing to supervise; these will be described to you at the scheduled dissertation meetings.

The topics will vary in type. Some dissertations will be mainly surveys of the mathematical literature on a given subject; others will involve the student tackling special cases (or simplified versions) of well-understood applications, and these may include some programming. All projects will inevitably require you to read and reason on your own. Your dissertation will therefore need to be logically structured, and give evidence of your having independently assimilated certain material. Its assessment will be a reflection of the various skills needed in putting your knowledge down on paper. It will be assessed by two Internal Examiners (i.e., internal to the Department) and one External Examiner (external to the LSE). One of the Internal Examiners is likely to be your supervisor.

### What you should aim to achieve in the dissertation

You must demonstrate:

- (a) *Accuracy and depth of analysis.* This should be taken to mean accuracy in developing a mathematical argument at a suitably advanced level consistent with skills taught to you in the programme. This includes accuracy in writing down mathematical expressions and proofs.
- (b) *Familiarity with the academic (and perhaps professional) literature relevant to your topic.* This includes visible proof that you have understood relevant material in the taught courses and/or in the literature, a critical awareness of the contribution of different researchers (hence accurate citation of references, as well as sufficient referencing of pertinent material). Your selection of material to emphasise and include in the dissertation will help to demonstrate the depth of your understanding.

- (c) *A clear explanation of the mathematical methods used in your study.* This includes giving reasons for your chosen approach to the subject.
- (d) *The ability to organise written work clearly and logically.* This includes clarity of expression and the extent to which your presentation is self-contained. A mathematically informed reader, such as one of your fellow students or the second Examiner, though not necessarily a specialist in your chosen subject, should be able to follow your reasoning. (This is where due regard must be given to organisation into: table of contents, introduction, sections, conclusions and appendices.)
- (e) *Reflective self-criticism.* This means identifying shortcomings in your approach and suggestions for further advancement of knowledge.

You will thus be judged on (a) Analysis, (b) Content, (c) Presentation, (d) Organisation and (e) Critical Judgment. In addition Examiners assess the extent of your Originality. This means the extent to which your exposition of known results is novel and not merely following largely an existing source, and whether you have produced some new result on your own. Even if there are few or no new results of your own, a good survey of existing literature can still be 'original'.

### Guidelines for marking MSc Dissertations

In general terms a candidate's work would need to possess the following attributes for it to be so classified:

#### Distinction (70–100)

A mark of 70–79 assesses the student as having achieved most of the following strengths:

- excellent evaluation (e.g., a particular wide range of literature) and integration of existing literature;
- significant insight and originality in dealing with critical issues;
- where appropriate (where programming is involved): careful attention to program design issues;
- outstanding command of expression, and accuracy in analysis, throughout the dissertation.

A mark of 80–89 assesses the student as, in addition to the criteria for a mark of 70–79, having obtained new results (or new methods to obtain existing results), or mastered material of

a particularly advanced level. Excellent organisation and skilful structuring are expected.

A mark of 90-100 assesses the student as, in addition to the above, having produced work of which the major part consists of new results.

### **Merit (60–69)**

Dissertations awarded a Merit are likely to meet many, but not all, of the criteria for a Distinction. In general, they will be sound (i.e., correct), well written and therefore clear. They will demonstrate reasonable insights and sophistication in the use of accurate argument, methods and material. They will have a comprehensive if not outstanding bibliography. If programming is involved, then the programs will be correct, although not necessarily elegant or efficient. Demonstration of deeper knowledge would be rewarded with a higher grade in this range.

### **Pass (50–59)**

Dissertations in this range are likely to demonstrate adequate organisation and presentation with occasional lapses (but no fundamental flaws). They may be lacking in clarity on occasion, and may be more descriptive than analytical. There is likely to be little evidence of original thinking, but they will still require sustained demonstration of competence in the topic.

### **Fail (40–49) or Bad Fail (0–39)**

These dissertations will generally be poorly organised and not written clearly. There will be insufficient application to the given terms of reference. It is likely that they will contain serious misconceptions of theory and/or examples cited, and seriously flawed arguments.

## **Plagiarism**

**Plagiarism is an assessment offence and carries very severe penalties. If found guilty of plagiarism you may not be allowed to complete your degree.**

Plagiarism is defined in the School regulations as follows:

*"All work for classes and seminars as well as scripts (which include, for example, essays, dissertations and any other work, including computer programs) must be the student's own work. Quotations must be placed properly within quotation marks or indented and must*

*be cited fully. All paraphrased material must be acknowledged. Infringing this requirement, whether deliberately or not, or passing off the work of others as the work of the student, whether deliberately or not, is plagiarism.*

*The definition of a student's own work includes work produced by collaboration expressly allowed by the department or institute concerned or, at MPhil/PhD level, allowed under the Regulations for Research Degrees. If the student has not been given permission, such work will be considered to be the product of unauthorised collusion and will be processed as plagiarism under these regulations.*

*Students should also take care in the use of their own work. A piece of work may only be submitted for assessment once. Submitting the same piece of work twice will be regarded as an offence of 'self-plagiarism' and will be processed under these regulations. However, earlier essay work may be used as an element of a dissertation, provided that the amount of earlier work used is specified by the department and the work is properly referenced.*

*Each department and institute is responsible for instructing students on the conventions required for the citation and acknowledgement of sources in its discipline. The responsibility for learning the proper forms of citation lies with the individual student."*

The Regulations on Plagiarism can be found at the following web links:

[www.lse.ac.uk/resources/calendar/academicRegulations/RegulationsOnAssessmentOffences-Plagiarism.htm](http://www.lse.ac.uk/resources/calendar/academicRegulations/RegulationsOnAssessmentOffences-Plagiarism.htm)

[www.lse.ac.uk/resources/calendar/academicRegulations/statementOnEditorialHelp.htm](http://www.lse.ac.uk/resources/calendar/academicRegulations/statementOnEditorialHelp.htm)

Ensure that you familiarise yourself with these regulations.

In Mathematics courses, collaboration between students on **assessed coursework** is not permitted at any stage, and the work submitted must be solely the work of the individual student.

You should also be aware that the submission of work undertaken as part of a previous degree or the submission of the same piece of work for two different courses can be regarded as 'self-plagiarism'.

When handing in any work that counts towards your final assessment (i.e., assessed coursework

or the MSc Dissertation) you will be asked to sign a statement acknowledging that you have read and understood the School's *Regulations on Assessment Offences: Plagiarism*, and that all the work you are handing in is your own, except where fully referenced and acknowledged within the work to be assessed.

### Citations

The LSE Library offers classes and an online guide in citing and referencing. EndNote is installed on LSE computers and is available to buy from the IT Help Desk on the first floor of the Library. A free alternative is Zotero (zotero.org). For guidance from within the Department, refer to section 4 of Professor Bernhard von Stengel's dissertation guide: [tiny.cc/lsemathsdissertationguide](http://tiny.cc/lsemathsdissertationguide).

Detailed guidance on citation and referencing in Mathematics will be provided in the documentation relating to the Dissertation in Mathematics. This guidance will be distributed in the Dissertation Seminar MA498 (and can be accessed via the Moodle page of that seminar). The same information is relevant for assessed coursework in all other Mathematics courses as well.

For regular coursework, not counting towards the final assessment, some collaboration between students is allowed, subject to the approval of the lecturer.

**The penalty for plagiarism is severe.**

**Those suspected of plagiarism risk an appearance before an Assessment Misconduct Panel, and the decisions of this Panel may mean that you will be unable to complete the MSc.**

**Do not think that plagiarism will go undetected. Examiners know the area you are writing about in assessed coursework or in your Dissertation. Moreover, the School uses specialised software that searches for textual and other similarities between your work and all kinds of other material (not just publicly available online).**

**Ignorance is no defence!**

**If you are unsure, ask your Lecturer, Dissertation Supervisor or Academic Adviser.**

### When should the dissertation be submitted?

**The dissertation must be submitted before 16.00 on Friday 1st September 2017.**

### Penalties for Late Submission of Work

The School has a clear and strict policy on the late submission of any assessed coursework that counts towards your final degree marks. This includes, in particular, the dissertation. The rules are currently as follows; see

[http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters\\_InOrAfter2009-10.pdf](http://www.lse.ac.uk/intranet/LSEServices/TQARO/Calendar/RegulationsForTaughtMasters_InOrAfter2009-10.pdf)

- (i) All students must be given clear written instructions on what is required for assessed coursework and dissertations, and the deadline for their submission.
- (ii) If a student misses the deadline for submission he/she should first discuss the matter with the course teacher. If a student believes that he/she has good cause not to meet the deadline (e.g. illness/injury, bereavement or other serious personal circumstances), he/she may seek a formal extension, to be ratified by the Chair of the appropriate Sub-Board of Examiners.
- (iii) Extensions will be granted only where there is good cause backed by official supporting evidence (e.g. medical certificate), and where the circumstances are unforeseen and out of the student's control. All evidence must be in English. Any extension granted must be confirmed in writing to the student.

If a student fails to submit by the set deadline (or extended deadline as appropriate) the following penalty will apply:

*Five marks out of 100 will be deducted for coursework submitted within 24 hours of the deadline and a further five marks will be deducted for each subsequent 24-hour period (working days only) until the coursework is submitted. After five working days, coursework will only be accepted with the permission of the Chair of the Sub-Board of Examiners.*

**The penalty rules above will be strictly applied to all assessed coursework for your courses, and to the Dissertation in Mathematics!**

## School Services and Sources of Help, Advice and Information

### Student Services Centre (SSC)

The Student Services Centre is located on the ground floor of the Old Building. It provides advice and information on the following services

- Admissions (drop-in service)
- Certificates of Registration
- Course choice and class changes
- Examinations and results
- Fees – process fee payments and distribute cheques (drop-in service)
- Financial Support – Advice on scholarships, awards, prizes, emergency funding and studentships (drop-in service)
- Information for new arrivals
- Programme Registration
- Graduation Ceremonies
- Transcripts and Degree certificates
- Visa and immigration advice (drop-in service)

The SSC provides a counter service for students between 11am and 4pm every weekday.

You can also contact us by telephone. Details of who to contact and more information can be found on our website: [lse.ac.uk/ssc](http://lse.ac.uk/ssc)

### Advice, Communications & Operations

The Advice, Communications & Operations provide advice to students on academic matters (particularly around non-progression, interruption and withdrawals), run the Student Services enquiry counter, co-ordinate Welcome Week and co-ordinate Student Services Centre communications: Their specific responsibilities include:

- Providing the first point of contact for enquiries and signposting enquirers to the appropriate school services
- Coordinating all School Welcome Week events, maintaining the [Your First Weeks](#) web pages and managing the [Off Campus Support Scheme](#)
- Providing one-to-one advice on [School Regulations and Codes of Practice](#)
- Processing applications to the Repeat Teaching Panel and monitoring attendance
- Producing replacement student ID cards for undergraduate and taught masters students
- Administering the School's student consultative fora and the Departmental Tutors Forum

Contact the Advice, Communications & Operations team with a general enquiry

- In person: at the SSC counter during opening hours
- By email: [ssc.advice@lse.ac.uk](mailto:ssc.advice@lse.ac.uk)
- Over the telephone: 020 7955 6167

### International Student Visa Advice Team (ISVAT)

ISVAT provides detailed immigration advice for International Students on their website which is updated whenever the immigration rules change. They can advise you by e-mail (fill out the web query form on the ISVAT website) and at the drop-in service in the Student Services Centre reception. ISVAT run workshops to advise students applying to extend their stay in the UK; and in complex cases, they will make individual appointments.

ISVAT can advise you on the following (and more):

- Applying to extend your stay in the UK
- Switching immigration categories
- Immigration implications if you need to interrupt your studies or retake your exams
- Correcting the end date of your visa if there has been a mistake
- Bringing your family to the UK or applying for your family to extend their stay inside the UK
- What to do if your visa application is returned as invalid or is refused
- Registering with the police
- What to do if your passport is lost or stolen
- Travelling in and out of the UK
- Working during your studies
- Options for working after your studies (please note we do not advise on the actual application process)

ISVAT also manages staff and student exchanges through the Erasmus + programme at LSE. For more information on our exchanges, go to: [lse.ac.uk/Erasmus](http://lse.ac.uk/Erasmus).

For more information including drop in times and dates of workshops go to: [www.lse.ac.uk/ISVAT](http://www.lse.ac.uk/ISVAT).

### Fees

The School offers two options for payment of fees. You can either pay them in full prior to Registration or by Payment Plan. If you do not know the cost of your fees, please see the [Table of Fees](#) at [www.lse.ac.uk/feesoffice](http://www.lse.ac.uk/feesoffice).

Full fee information, including how to pay, can be found here:

[http://www.lse.ac.uk/intranet/LSEServices/financeDivision/feesAndStudentFinance/Paying%20fees/How\\_to\\_Pay.aspx](http://www.lse.ac.uk/intranet/LSEServices/financeDivision/feesAndStudentFinance/Paying%20fees/How_to_Pay.aspx)

### Penalties for late payment

There are penalties for late payment. These may include loss of library rights, de-registration, referral to Credit Control or fines. You will be warned by email if your payments are late and/or if sanctions are going to be

imposed on you. At this time you are able to contact the Fees Office directly.

Please visit the Fees Office website for more information: [www.lse.ac.uk/feesoffice](http://www.lse.ac.uk/feesoffice).

## Financial Support

The Financial Support Office (FSO) is responsible for the administration and awarding of scholarships, bursaries, studentships and School prizes. FSO also provide information about funds such as the Student Support Fund, LSE Access Fund and the Postgraduate Travel Fund. It is located within LSE's Student Services Centre with a daily drop in session during term time between 13.00 and 14.00 (Mondays, Wednesdays and Fridays during vacations). No appointment is necessary.

Full details and application forms are available from <http://www2.lse.ac.uk/intranet/students/moneyMatters/financialSupport/Home.aspx>

## Certificate of Registration

A certificate of registration provides proof to organisations, such as the Home Office, council tax offices and banks, that you are registered as a current student at LSE.

Once you are formally registered with the School you will be able to print out your certificate via LSE for You. The 'Certificate of Registration' option can be found in the 'Certification and Documentation' section of LSE for You. Please be aware it can take up to 4 hours for your change in Registration Status to be picked up by LSE for You so you may have to wait a short time if you've just registered. If you require this certificate to be signed and stamped, staff at the Student Services Centre will be happy to do this for you.

If you require a certificate with information beyond what is on the Certificate of Registration please see [lse.ac.uk/registrydocuments](http://lse.ac.uk/registrydocuments).

## Results and transcripts of results

The School releases confirmed marks once the relevant School Board of Examiners has ratified them. For further information, please see [lse.ac.uk/results](http://lse.ac.uk/results).

To ensure that your results are released as scheduled, please check your balance on LSE for You to see if you have any outstanding tuition, halls or library fees. You should contact the Fees Office on [fees@lse.ac.uk](mailto:fees@lse.ac.uk) if you have any queries, as the School will not release your results if you have an outstanding debt. Transcripts for finalists are issued digitally within

ten working days of final results being officially published. Continuing students will be able to request an 'intermediate transcript' of results as soon as they are officially published.

For more information, see [lse.ac.uk/transcripts](http://lse.ac.uk/transcripts).

## Presentation Ceremonies

The Graduation Ceremony for MSc Applicable Mathematics students normally takes place in December. The ceremonies take place on campus in the Peacock Theatre. The Student Services Centre emails invitations, which include details of the ticket booking process, are emailed to eligible undergraduate and taught postgraduate students five to six months before the ceremonies are scheduled to take place. The ceremony itself usually lasts between one and one and a quarter hours and is immediately followed by an on-campus drinks reception. For more information, including the dates of future ceremonies and details of the School's overseas ceremonies, please see [www.lse.ac.uk/ceremonies](http://www.lse.ac.uk/ceremonies)

## Degree Certificates

The degree certificate gives your full name, level of award, programme of study, and class of degree or other award obtained. It will be available for collection on the ceremony days of the relevant graduation period in July or December. If you don't collect it at the ceremony, it will be posted to your home addresses within four to six weeks. It is therefore essential that you keep your details up-to-date on LSE for You.

For more information, please see [www.lse.ac.uk/degreeCertificates](http://www.lse.ac.uk/degreeCertificates).

## Teaching and Learning Centre

LSE's Teaching and Learning Centre provides a range of events, resources and services that will complement your academic study and help you to make the most of your time here.

## LSE Study Toolkit

A brand new web resource, LSE Study Toolkit – [www.lse.ac.uk/studytoolkit](http://www.lse.ac.uk/studytoolkit) – is designed to help you tackle LSE-style study with confidence. Four areas identified by current students as vital to success at LSE – justifying your arguments, studying independently, communicating your ideas and honing your quantitative skills – are addressed with short films and expert guidance that provide the tools necessary for effective and rewarding study.



## LSE LIFE

LSE LIFE is the School's centre for academic, professional and personal development. We are here to help you find your own 'best' ways to study, think about where your studies might lead you, and make the most of your time at LSE.

We offer

- guidance and hands-on practice of the key skills you'll need to do well at LSE: effective reading, academic writing and critical thinking
- workshops related to how to adapt to new or difficult situations, including development of skills for leadership, study/work/life balance, and preparing for the working world
- a place to meet and work together with your peers on interdisciplinary group projects and research
- support in making the transition to (or *back to*) university life;
- advice and practice on working in study groups and on cross-cultural communication and teamwork
- ideas and inspiration about academic pursuits and pathways into professional life

and much more ...

LSE LIFE is located on the ground floor of the library and is your first port of call to discover what is available for you. The LSE LIFE team, together with advisers and specialists from LSE Careers, LSE Library, the Language Centre and other parts of the School, will be on hand to answer your questions. Sign up for a workshop, come by for help with your homework, or just drop in.

[lse.ac.uk/lselife](http://lse.ac.uk/lselife)

### Personal development

There are many ways in which LSE supports the personal development and wellbeing of students, both on and off campus.

### Personal development events

There are lectures and group based workshops across the year on topics such as stress management, overcoming perfectionism and coping with personal difficulties. See [www.lse.ac.uk/tlc/development](http://www.lse.ac.uk/tlc/development) and [www.lse.ac.uk/counselling](http://www.lse.ac.uk/counselling)

### Student Wellbeing Service: One to one support

LSE's Student Counselling Service [www.lse.ac.uk/counselling](http://www.lse.ac.uk/counselling) offers bookable one to one appointments and daily drop in sessions; its Peer Support scheme [www.lse.ac.uk/peersupport](http://www.lse.ac.uk/peersupport) enables students to talk with fellow students if they have any

personal worries. The Disability and Wellbeing Service [www.lse.ac.uk/disability](http://www.lse.ac.uk/disability) provides advice to disabled students, makes Individual Student Support Agreements and helps with Individual Examination Adjustments.

### LSE Personal Development Aide Memoire (PDAM)

This is a record that you can access and build in LSE for You and which enables you to keep track of the skills and experience you gain through any extra-curricular activity you undertake while you are at LSE, both within and beyond the School. The PDAM is automatically populated from a number of different LSE systems and can also be updated manually.

Once completed, it will enable you to provide information and evidence about what you have done beyond your studies, making it useful for volunteering, internship and job applications. To find out more, see [www.lse.ac.uk/apd/PDAM](http://www.lse.ac.uk/apd/PDAM)

### Volunteering with LSE's Widening Participation (WP) team

WP aims to raise aspiration and attainment in young people from London state schools. We deliver a number of projects that encourage young people from under-represented backgrounds to aim for a university education. We need enthusiastic LSE students to be inspiring role models and to contribute to the success of our programmes. Visit [lse.ac.uk/wideningparticipation](http://lse.ac.uk/wideningparticipation) or email [widening.participation@lse.ac.uk](mailto:widening.participation@lse.ac.uk) for more information.

## The Language Centre

### English Language Support

If English is not your first language the Language Centre is on hand to give you advice and support throughout your time at LSE. The support is free and starts as soon as your main programme starts. There are specific classes for academic units and information sessions are held during the first days of term to advise you on the most appropriate classes to take. Classes begin in week 2 of the Michaelmas Term. Please see [www.lse.ac.uk/languages](http://www.lse.ac.uk/languages) for information on the English for Academic Purposes (EAP) In- sessional Support Programme.



## Foreign Language Courses

The Language Centre offers a number of extra curricular language courses. Courses run from October through to April. Registration begins in September. Details can be found at the following link:

<http://www.lse.ac.uk/language/ModernForeignLanguages/Certificate/MFLCertificateHome.aspx>

MSc Mathematics students wishing to pursue one of these courses can apply for financial support by contacting the MSc Mathematics Programme Manager. Funding is given on a first-come-first serve basis.

## LSE Careers

LSE Careers works very closely with postgraduate students from the Department of Mathematics. They are a very active service offering a wide range of seminars, employer presentations, fairs and face-to-face appointments to help you at every stage of the career planning process; from deciding what you want to do to preparing for interviews and settling into your first job. As your course only lasts a year, it's best to get started on your career planning almost as soon as you arrive to increase your understanding of different career areas and to maximise the opportunities open to you. Their very popular Banking and Finance and Consultancy careers fairs all take place in the first few weeks of term so make sure you register so you don't miss out!

LSE Careers also work with the Department to offer events specifically for Mathematicians, including the very popular 'What can you do with an LSE Mathematics degree?' panel and networking lunch and 'Meet the alumni'— a careers networking evening specifically for MSc students. There are also employer led workshops covering specialised occupational areas and application processes including technical finance interviews and psychometric testing.

LSE attracts top recruiters from many sectors who use our vacancy board to advertise hundreds of internships, voluntary, part-time and graduate positions. You can access the vacancy board, book appointments and attend events through LSE CareerHub at [careers.lse.ac.uk](http://careers.lse.ac.uk)

The LSE Careers website [www.lse.ac.uk/careers](http://www.lse.ac.uk/careers) and blog are also full of tips, advice and information about every stage of the career process, from CV writing to interviews, and information about a wide range of employment sectors (including banking, finance, accountancy, actuarial and consultancy) and international

## St Philips Medical Centre

[www.lse.ac.uk/collections/medicalCentre/](http://www.lse.ac.uk/collections/medicalCentre/)

The Medical Centre is a general NHS practice which LSE students can use if they live within the practice's catchment area. The Centre also provides dental facilities, an osteopath, an acupuncturist, and more general first aid, vaccination, travel and contraceptive advice. Register online at [www.spmc.info](http://www.spmc.info) for NHS registration.

## Deans of the School

The Deans have a wide range of duties relating to the School's student community. They are available to any student who wishes to discuss academic or personal issues. The Deans will see students by appointment or during their office hours. Appointments can be booked through their Executive Assistants. Contact details can be found at this link:

[www.lse.ac.uk/intranet/students/academicSupportServices/home.aspx](http://www.lse.ac.uk/intranet/students/academicSupportServices/home.aspx)

Although the Deans are available to meet any student to discuss personal or academic matters, students should seek the advice and support of their Academic Adviser and Departmental Tutor/Programme Director before coming to the Deans.

## Advisers to Students

The school has specialist advisers to male and female students. They are available to discuss issues of concern to students in the School and to offer advice and support to students with personal problems.

The adviser to women students is Dr Bingchun Meng  
Office: TW2.1.01h, Email: [b.meng@lse.ac.uk](mailto:b.meng@lse.ac.uk)  
Telephone: +44 (0) 20 7107 5020

The adviser to male students is Dr Jonathan Hopkin, Room CON 5.18, telephone number: 020 7955 6335, and by email at: [j.r.hopkin@lse.ac.uk](mailto:j.r.hopkin@lse.ac.uk)

## The Faith Centre

The Faith Centre in the Saw Swee Hock Building brings together multi-faith facilities for prayer, worship, and faith society meetings, as well as providing a contemplative space on campus available to all staff and students. The Chaplain is also available to provide pastoral support to anyone seeking conversation or advice and to support religious life and cohesion within the wider School community.

For more information about events and services, consult the *Religion and Belief Guide*:

<http://www.lse.ac.uk/intranet/LSEServices/faithCentre/Home.aspx>

## Services for disabled students

### (including students who have dyslexia and other neurodiverse conditions)

Disability equality is an important facet of the equality and diversity agenda. LSE acknowledges that disabled students have often overcome additional barriers in order to gain a university place, and is committed to eliminating further unnecessary obstacles and to facilitating equal access to study and university life.

The Disability and Well-being Service (DWS) runs three specialist services, all of which are free and confidential:

- The Disability Service, for students with physical/sensory impairments and those with long-term or chronic medical conditions
- The Neurodiversity Service, for students with dyslexia, dyspraxia, Asperger syndrome and other neurodiverse conditions
- The Mental Health and Well-being Service, for students with mental health concerns

The DWS can also set up Individual Student Support Agreements (ISSAs), outlining reasonable adjustments such as extended library loans, negotiated deadlines and rest breaks in exams.

It runs several interest and support groups, for example the Neurodiversity Interest Group and the Circles Network.

For further information please visit [www.lse.ac.uk/disability](http://www.lse.ac.uk/disability) or email [disability-dyslexia@lse.ac.uk](mailto:disability-dyslexia@lse.ac.uk).

## LSE Student Counselling Service

This free and confidential service aims to enable you to cope with any personal or study difficulties that may be affecting you while at LSE. As well as one-to-one appointments, there are group sessions and workshops throughout the year on issues such as exam anxiety and stress management. For full details, please see [www.lse.ac.uk/counselling](http://www.lse.ac.uk/counselling)

All counselling sessions need to be booked in advance, but there are also a number of drop-in sessions available each day. (please see the website). You can make appointments by email ([student.counselling@lse.ac.uk](mailto:student.counselling@lse.ac.uk)), phone (020 7852 3627) or by coming in to the Teaching and Learning Centre Reception (KSW 5.07, on the 5th floor of 20 Kingsway).

## Peer Support

The Student Counselling Service runs a Peer Support Scheme. A group of 16 undergraduate students are trained at the end of their first year to offer emotional support to all other LSE

students (especially new first year students). The scheme is mainly based within the halls of residences, but there are also a number of campus based Peer Supporters.

Peer Support provides students with an informal space to talk to a specially selected non-judgmental peer. It can sometimes be hard to talk to friends and family about certain issues, and some students prefer to see a Peer Supporter to talk about anything that is troubling them.

Peer Supporters are not counsellors, but have been specifically selected and formally trained in listening, questioning and responding skills to ensure they are able to help other students to reach their own solutions. They are also able to provide students with information and point them in the direction of further help.

For further information, or to contact a Peer Supporter, see:

[www.lse.ac.uk/collections/studentCounsellingService/peersupport](http://www.lse.ac.uk/collections/studentCounsellingService/peersupport)  
[www.facebook.com/LsePeerSupport](https://www.facebook.com/LsePeerSupport)

## LSE's Policy Statement on Equality and Diversity

The London School of Economics and Political Science is committed to promoting equality and diversity in order to deliver the best possible service to its students, staff and the wider community, in accordance with its Articles of Government.

Equality of opportunity means that the School views the diverse origins and backgrounds of its employees and students positively; and that it seeks to become as varied an employment community as it can.

The School will seek to ensure that people are treated equitably, regardless of age (subject to statutory retirement requirements), disability, race, nationality, ethnic or national origin, gender, religion, sexual orientation, personal circumstances, political affiliation or trade union membership.

The School also has anti-harassment procedures. For further information see:

<http://www.lse.ac.uk/intranet/LSEServices/policies/pdfs/school/harPol.pdf>

## Equity, Diversity and Inclusion at LSE

To uphold the School's commitment to equality of respect and opportunity, as set out in the [Ethics Code](#), we will treat all people with dignity and respect, and ensure that no-one will be treated less favourably because of their role at the School, age, disability, gender (including gender identity), race, religion or belief sexual orientation, marriage and

civil partnership, pregnancy and maternity and social and economic background.

In practice, this means we expect you to:

- Treat all members of the School community fairly and with respect;
- Act courageously and openly, with respect for the knowledge and experience of others;
- Play your part in creating an environment that enables all members of the School community to achieve their full potential in an environment characterised by equality of respect and opportunity; and
- Actively oppose all forms of discrimination and harassment, including challenging and/or reporting unacceptable behaviour.

The School is committed to embedding and mainstreaming equity, diversity and inclusion. For further advice or information, please visit the School's Equality and Diversity website (<http://www.lse.ac.uk/equityDiversityInclusion>), see our blog, and follow us on Twitter @EDI\_LSE.

### Access Guides to LSE buildings

DisabledGo have produced detailed access guides to the LSE campus and residences, and route maps between key locations. These are available at: <http://www.lse.ac.uk/mapsAndDirections/AccessibilityMap.pdf>

### Quality Assurance

The School's approach to quality assurance is set out in the document "Strategy for Managing Academic Standards and Quality":

[www2.lse.ac.uk/intranet/LSEServices/TQARO/InternalQualityAssurance/StrategyForManagingAcademicStandards.aspx](http://www2.lse.ac.uk/intranet/LSEServices/TQARO/InternalQualityAssurance/StrategyForManagingAcademicStandards.aspx)

It sets out broad principles and processes for assuring academic standards and for enhancing the quality of educational provision.

### Student Teaching Surveys

The Teaching Quality Assurance and Review Office (TQARO) conducts two School-wide surveys each year to assess students' opinions of teaching, one in each of the Michaelmas and Lent Terms.

Teaching scores are made available to individual teachers, Heads of Departments, the Director of the Teaching and Learning Centre and the Pro-Director (Teaching and Learning). In addition to producing reports for individual teachers, TQARO produces aggregated quantitative data for departments and the School, which provide important performance indicators. These can be found on the TQARO website:

<http://www2.lse.ac.uk/intranet/LSEServices/TQARO/TeachingSurveys/Results/Home.aspx>

Results of the 'course' section of the surveys are made available to students through the online course guides

In the Summer Term TQARO will also invite students to complete the Postgraduate Student Survey. This questionnaire is about your degree programme overall, and you are not asked to assess individual courses or teachers.

You are strongly encouraged to get involved and complete these surveys as they are an opportunity for you to inform the School about your particular experience, and at the same time, it is an invaluable source of information that will help the School to improve the student learning experience. These surveys are conducted in confidence and take only a short time to complete. The results will be fed into various quality assurance and enhancement processes. LSE takes all student feedback seriously and is constantly working to make improvements and so your views really matter.

### LSE Library

#### [lse.ac.uk/library](http://lse.ac.uk/library)

Your LSE student card is also your Library card. No additional registration with the Library is required, but you will need your PIN to borrow books. It is available on our website and on LSE for You.

Use Library Search ([catalogue.lse.ac.uk](http://catalogue.lse.ac.uk)) to find both the Library's print and electronic resources.

Information about how to use Library services effectively is available online ([lse.ac.uk/library/usingTheLibrary](http://lse.ac.uk/library/usingTheLibrary)). You can also sign up to a course on how to find items from your reading list, and other training events from across the School, at [apps.lse.ac.uk/training-system](http://apps.lse.ac.uk/training-system).

Your Academic Support Librarian is Nancy Graham email: [n.graham1@lse.ac.uk](mailto:n.graham1@lse.ac.uk)

Staff on the Help Desk are available for any enquiries you may have about using the collections and electronic resources. You can also contact the Library by email: [library.enquiries@lse.ac.uk](mailto:library.enquiries@lse.ac.uk)

When inside the Library building, please remember:

- To respect the zone you are in and keep noise to a minimum in Quiet and Silent zones.
- Food cannot be consumed inside the library, although you are able to eat in the Escape area (before the turnstiles).
- Only drinks with lids can be brought into the

- Library.
- Fully vacate your study space for others when taking a break.
- Do not leave your bags or other items unattended.

You can follow us: @LSELibrary and facebook.com\LSELibrary.

## Catering

<http://www.lse.ac.uk/intranet/LSEServices/cateringServices/Home.aspx>

For details of catering facilities located around the School, please see the above website. LSE Catering Services became the first London university to achieve Fairtrade status in 2004. Fairtrade refreshments are available in all the School's catering outlets.

## Alumni Association

LSE's Alumni Association is the official voice of LSE's global alumni community, comprising more than 108,000 people in over 190 countries, 53 country groups, nine special interest groups and 24 contact networks.

Its primary role is to support the alumni programme co-ordinated by the LSE Alumni Relations team by a) developing and supporting the network of international and special interest alumni groups and contact networks, and, b) representing the voice of the alumni community within the School.

You automatically become a member upon graduation. Membership is free. By registering with the Houghton Street Online community, you will be able to stay connected with former classmates and the School after your graduation. You will receive a monthly e-newsletter, *LSE Alumni Echo*, and the biannual alumni magazine, *LSE Connect*.

LSE alumni also have access to:

- Alumni Professional Mentoring Network
- LSE Careers for up to two years after graduation
- An email forwarding address to continue using an LSE email address
- The Library's printed collections on a reference basis, and can borrow free of charge

For more information about the benefits and services available to alumni, please visit [LSE Alumni Online](#) or contact the Alumni Relations team on [alumni@lse.ac.uk](mailto:alumni@lse.ac.uk).

## Sustainability at LSE

<http://www.lse.ac.uk/intranet/LSEServices/estatesDivision/sustainableLSE/home.aspx>

Sustainability is an important part of life at the LSE. We have put together a few easy and fun tips:

- Join the Sustainable Futures student society
- Join a Green Impact team in your academic department
- Join the Student Switch Off competitions in halls
- Contribute your research and views to the LSE Sustainability Blog
- Get your hands dirty at the roof gardens
- Volunteer at green events
- Apply for funding for your own project through the Sustainable Projects Fund
- Use a reusable coffee cup or water bottle—available on campus
- ReLove your old stuff at the ReLove fair and at your halls of residence (details on our website)
- Switch things off when not using them, especially overnight
- Take a short shower

You can also get in touch through our Facebook ([Sustainable LSE](#)) and Twitter (@SustainableLSE).

## Computers and IT Services

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[www.lse.ac.uk/imt](http://www.lse.ac.uk/imt)

The LSE has a growing number of computers in computer classrooms, open access computer areas around the School, and computer rooms in student residential halls. You will find computers with a broad range of the major software packages. There is also a high-speed network providing further access to a wide range of software and electronic mail. Email, the internet, and specialised software play an increasingly important role in your studies and further career, so it is a good idea to familiarise yourself with them as soon as possible!

All students get a username and password allowing access to the computers in public areas.  
**Keep this password secret at all times.**

Users of LSE IT facilities are bound by the School's rules and regulations for IT use. You can find these at [www.lse.ac.uk/intranet/LSEServices/policies/home.aspx](http://www.lse.ac.uk/intranet/LSEServices/policies/home.aspx). If you break one of these rules, for instance by sending abusive emails, you can be barred from using the School's computer systems.

IT services run many courses where you can learn to use computers in general, but also provide introduction to specific software. Information about computer facilities and training can be obtained from the IT Services help desk on the first floor, Library. Lots of information can also be found via the website [www.lse.ac.uk/imt](http://www.lse.ac.uk/imt)

All public computer rooms and areas have printing facilities. The opening hours vary. See [www.lse.ac.uk/intranet/LSEServices/IMT/facilities/students/home.aspx](http://www.lse.ac.uk/intranet/LSEServices/IMT/facilities/students/home.aspx) For security reasons, you will need your LSE ID card to get access. Public room computer use can now be viewed via a real-time car park style information service to help students to identify available PCs instead of queuing. This information can be viewed on the PCs in the kiosks on many ground floors of the School buildings and on the plasma information screens.

Students who want to connect their own computer to the LSE network can find more information on [www.lse.ac.uk/IMT/remote](http://www.lse.ac.uk/IMT/remote) All rooms in LSE residences should have their own network connection. Inside the academic buildings there are more and more wireless access points as well (in particular in the catering facilities).

## IT Support

### **Student IT Help Desk – first floor, Library**

Contact the IT Help Desk ([it.helpdesk@lse.ac.uk](mailto:it.helpdesk@lse.ac.uk)) for support for School-owned hardware and software on the LSE network, network and email account issues, and general IT queries.

### **VITA (Virtual IT Assistance)**

Double click on the 'Virtual IT Assistance' icon on the desktop of a campus PC to get real-time assistance from an IT Help Desk Adviser during opening hours.

### **Laptop Surgery**

#### **Walk In Centre, 1st Floor, Library**

Opening hours: 10:00-16:00 during term time  
Visit the Laptop Surgery for free advice and hands-on help with problems connecting to LSE resources from personally-owned laptops and mobile devices.

### **LSE Mobile**

Download the LSE Mobile app to access your course timetable, library information, LSE information, maps, guides and more. Search 'LSE Mobile' on the App Store or Google Play to download.

### **IT Support for students with disabilities**

<http://www.lse.ac.uk/intranet/LSEServices/IMT/accessibility/home.aspx>

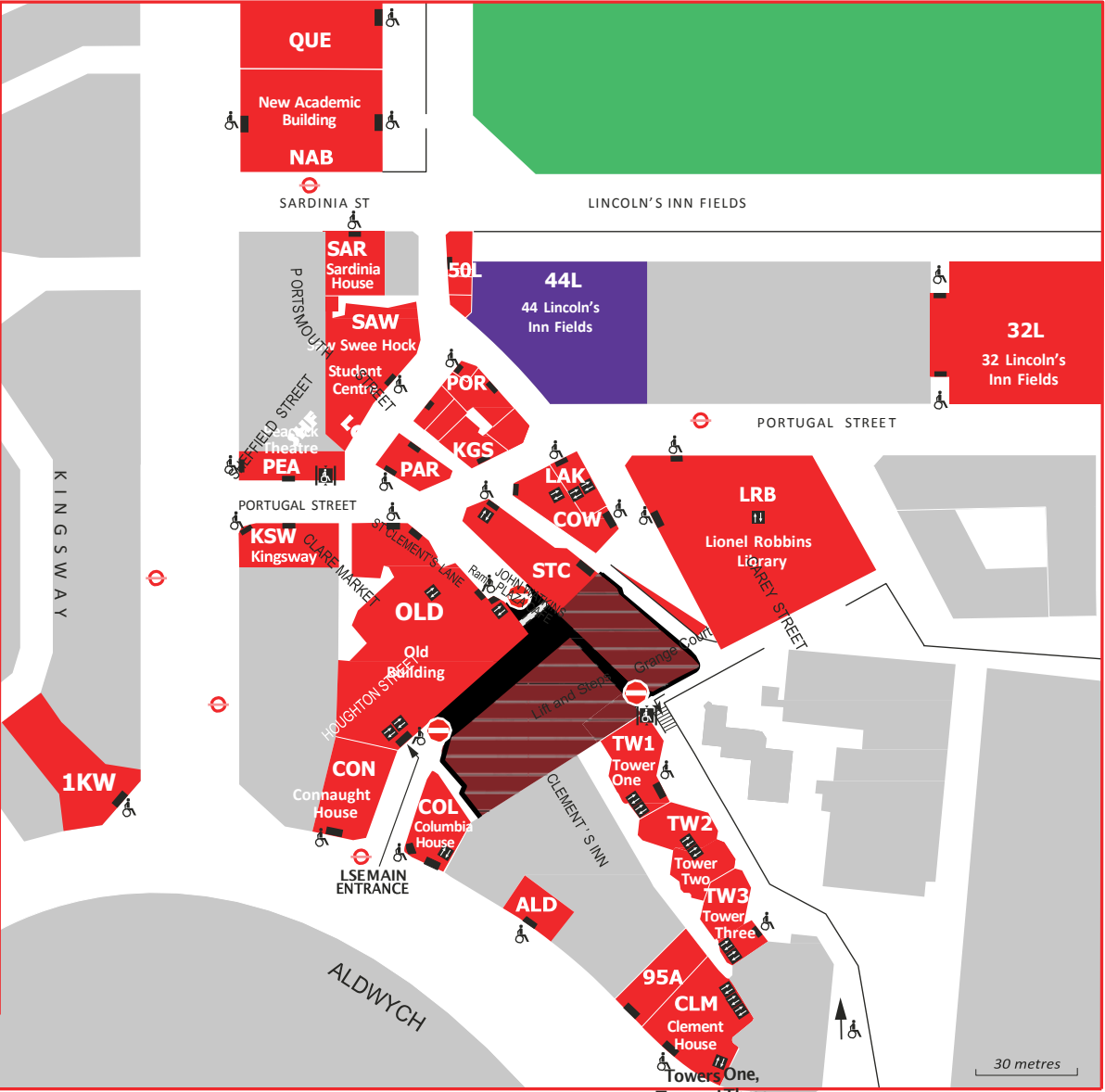
The School is committed to providing facilities and support for students with disabilities. Additional PCs and printing facilities for students with disabilities are provided in the public computer areas in the Library. Other facilities are available in dedicated PC rooms in the Library (LRB R.25 and LRB R.26) and Tower 1 TW1.G.04d. We also provide one-to-one support for students with disabilities who wish to become familiar with assistive technologies and software. This can be arranged by contacting Sebastiaan Eldritch-Böersen via [its.disabilities.support@lse.ac.uk](mailto:its.disabilities.support@lse.ac.uk) to arrange an appointment.

### **Social Media**

The School has outlined guidance on the use of social media. You can find the full details here: <http://www.lse.ac.uk/intranet/LSEServices/policies/pdfs/school/guiSocMedStu.pdf>

For contact details and further information about our support services visit [www.lse.ac.uk/imt](http://www.lse.ac.uk/imt)





- Bridge
- Cycle Hire Station ([www.tfl.gov.uk/maps/cycle-hire](http://www.tfl.gov.uk/maps/cycle-hire))
- Disabled access
- Disabled lift
- No entry
- Roads and Footpaths closed
- Buildings under construction

95A	95 Aldwych <i>Aldwych</i>
ALD	Aldwych House <i>Aldwych</i>
CLM	Clement House <i>Aldwych</i> .
COL	Columbia House <i>Aldwych</i>
CON	Connaught House <i>Aldwych</i>
COW	Cowdray House <i>Portugal Street</i>
KGS	King's Chambers <i>Portugal Street</i>
1KW	1 Kingsway
KSW	20 Kingsway
32L	32 Lincoln's Inn Fields
44L	44 Lincoln's Inn Fields (not occupied by LSE)
50L	50 Lincoln's Inn Fields <i>Portsmouth Street</i>
LCH	Lincoln Chambers <i>Portsmouth Street</i>
LAK	Lakatos Building <i>Portugal Street</i>
LRB	Lionel Robbins Building, Library

NAB	New Academic Building <i>Lincoln's Inn Fields</i>
OLD	Old Building <i>Houghton Street</i>
PAR	Parish Hall <i>Sheffi Street</i>
PEA	Peacock Theatre <i>Portugal Street</i>
POR	1 Portsmouth Street
QUE	Queens House <i>Lincoln's Inn Fields</i>
SAR	Sardinia House <i>Sardinia Street</i>
SAW	Saw Swee Hock Student Centre <i>Sheffi Street</i>
SHF	Sheffi Street
STC	St Clement's <i>Clare Market</i>
TW1	Tower One <i>Clement's Inn</i>
TW2	Tower Two <i>Clement's Inn</i>
TW3	Tower Three <i>Clement's Inn</i>