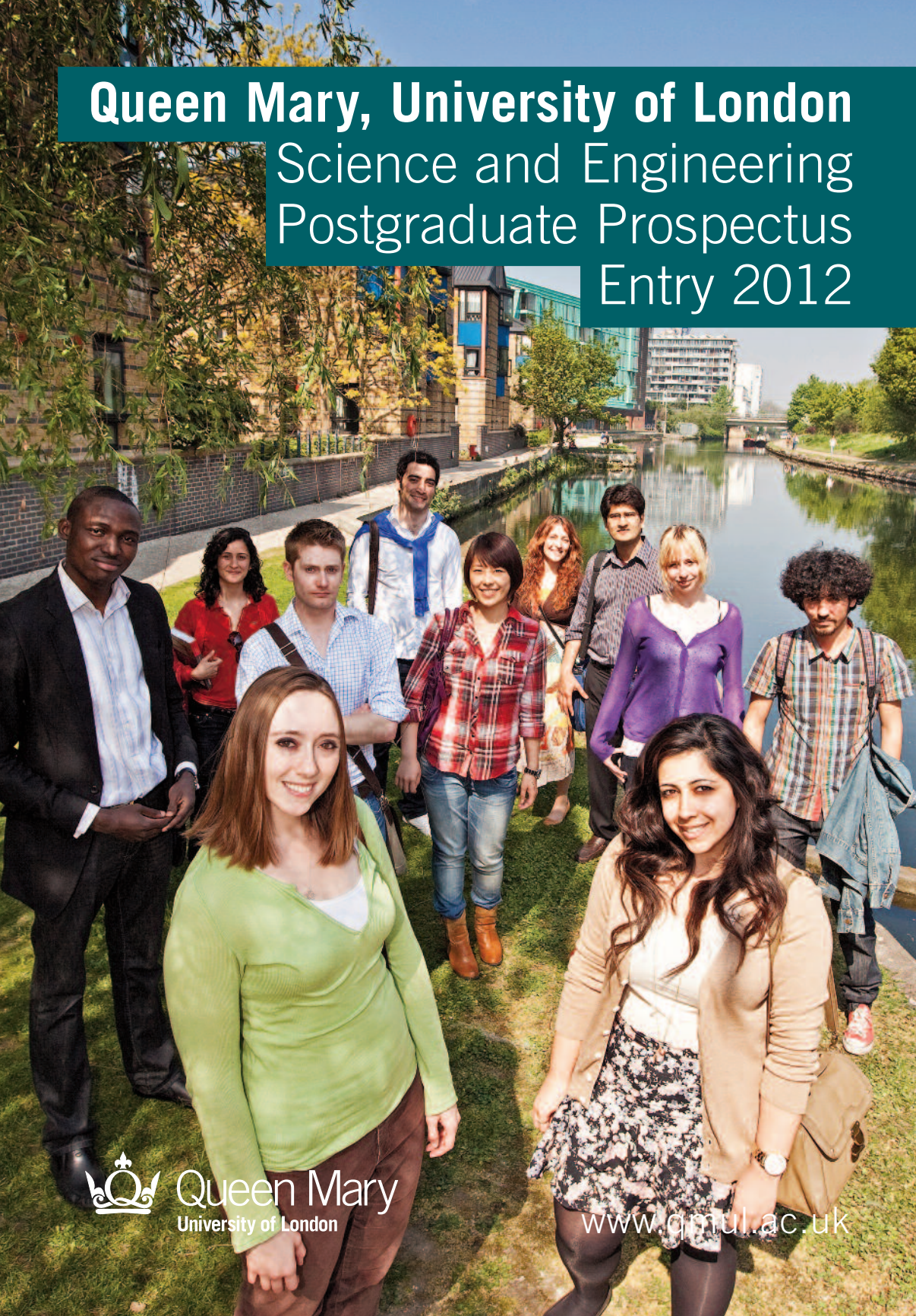
Queen Mary, University of London

Science and Engineering Postgraduate Prospectus Entry 2012



Queen Mary
University of London

www.qmul.ac.uk

Notes for applicants

A list of all science and engineering postgraduate degree programmes offered by the College can be found on page 152.

To apply please visit
www.qmul.ac.uk/postgraduate/apply

Alternatively, to request a paper application form, contact the Admissions and Recruitment Office on the details below.

If you have any admission enquiries the Admissions and Recruitment Office will be pleased to advise you.
Freephone: 0800 376 1800
If calling from outside the UK:
Tel: +44 (0)20 7882 5533
email: admissions@qmul.ac.uk

If you would like information on individual courses or research areas, please contact the relevant department.

Visit us!
Postgraduate Open Evening for 2012 entry is:
1 February 2012

To book your place:
email: askthegradteam@qmul.ac.uk
www.qmul.ac.uk/pgopenevening

Contact
Queen Mary, University of London
Mile End Road
London
E1 4NS
www.qmul.ac.uk

www.qmul.ac.uk

Contents

Welcome to the Faculty of Science and Engineering

Graduate study at Queen Mary is a demanding, exhilarating and, frequently, life-changing experience. We offer excellent teaching, up-to-date facilities, exciting opportunities for interdisciplinary collaboration and a focus on student employability.

The Faculty takes a multi-disciplinary approach to solving the big problems in science and engineering, including research focusing on body sensors, data networks, clean energy, tissue engineering, behavioural science and drug discovery. Areas of particular strength include the qMedia group, which links technology with the creative arts; Astronomy, which carries out work in collaboration with NASA, ESA, and the UK Space Agency; Bioengineering, which has a growing international reputation as a top research group in the UK; Materials, a multi-disciplinary group which works in collaboration with the School of Medicine and Dentistry; Photosynthesis, which underpins the strategy to develop bio-energy research; Physics, which helped to develop string theory and counts a recent Nobel laureate, Sir Peter Mansfield, as one of its alumni; and Networks and Security, which brings together mathematicians and scientists.

As a high-calibre postgraduate student you will play a key role in contributing to our future success. We look forward to welcoming you to our lively graduate community and to helping you to fulfil your ambitions.

Professor Jeremy Kilburn
Vice-Principal
Faculty of Science and Engineering

Faculty highlights

- Around 300 postgraduate taught students, 400 full-time research degree students, over 100 postdoctoral researchers and 300 research assistants and support staff.
- Annual turnover of £70m, of which £19m is competitively awarded research income.
- A focus on student satisfaction and employability: in the National Student Survey 2010 all schools scored between 80 and 90 per cent for satisfaction.
- Three National Teaching Fellows and several winners of the Drapers' awards for innovation in Teaching and Learning.
- Research Councils UK awarded six interdisciplinary Roberts Fellows, which put Queen Mary in the UK top ten for this scheme.
- Exciting launch of the ImpactQM project linking early career researchers with selected industry partners to exploit the Faculty's strengths in materials, electronic and mechanical engineering, and computer science. ImpactQM received nearly £3m in funding from the Engineering and Physical Sciences Research Council (EPSRC).
- Many successful spin-out companies – including ApaTech, a manufacturer of synthetic bone substitutes, which was awarded the top prize in the PraxisUnico Impact Awards.
- Recently completed £12m Joseph Priestley Building houses 1000m^2 of outstanding research facilities for environmental and chemical analysis, cell and molecular genetic imaging and the study of protein nanostructure and function.
- Extensively refurbished Mathematical Sciences and Biological and Chemical Sciences buildings provide state-of-the-art facilities.

Faculty structure

The Faculty is divided into five schools and over 20 research centres – You can find out more about each of them further on in this prospectus.

Research centres

- Centre for the Aquatic and Terrestrial Environment
- Centre for Digital Music
- Media and Arts Technology EPSRC Doctoral Training Centre
- Interdisciplinary Research Centre in Biomedical Materials
- The Genome Centre
- Imaging core facility
- Research Centre in Biological Psychology
- Centre for Life Sciences
- The River Communities Group
- Centre for Materials Research
- The NanoVision Centre
- Qmedia
- Astronomy Unit
- Maths Research Centre
- Centre for Research in String Theory
- Centre for Condensed Matter and Materials Physics
- Particle Physics Research Centre
- Research Centre in Psychology

Mathematical Sciences Building

"Besides good teaching and research, [Queen Mary] is one of the best universities for student employability and graduate starting salaries."

The Guardian University Guide 2012

G.E. Fogg Building, home to our Biological and Chemical science students

Welcome to Queen Mary, University of London

Taking up postgraduate study at Queen Mary is an exciting opportunity to join one of the UK's top universities, with an excellent research record, a great location and a friendly atmosphere. You will learn from leading experts and be able to build a strong network of colleagues who will be a valuable asset to your future career.

Exceptional learning environment

Queen Mary offers an environment designed to facilitate learning and equip you with the right tools for future success. Our priority is to provide you with high-quality and relevant programmes of study that enable you to get the very best out of the time you spend with us.

Alongside seminars and lectures, we offer first-class research and transferable skills training, dedicated postgraduate-only spaces, and multiple opportunities to present and discuss your work – both with your peers and at international conferences.

Research excellence and innovation

We facilitate world-leading research across all academic schools and departments, with an impressive track record in initiating exciting and innovative interdisciplinary collaborations. Researchers in the School of Biological and Chemical Sciences, for example, have recently won a grant of £212k to conduct interdisciplinary research into the use of nanogels as new drug delivery vehicles.

We are ranked highly in external measurement exercises – in the most recent Research Assessment Exercise (RAE), Queen Mary returned outstanding results and was placed 11th in the UK by *The Guardian*.

Studentships and bursaries

Each year Queen Mary offers research studentships and masters bursaries to its most highly new-qualified applicants. In recent years, awards to Science and Engineering students have totalled more than £1m per annum. These awards are available to both home and overseas students. For more information, see page 142.

The Times Higher Education on the last RAE:

"The biggest star among the research-intensive institutions was Queen Mary, University of London."

Postgraduate study at Queen Mary

- 3,551 postgraduate students following taught programmes or registered for research
- Students from 125 countries
- Over £250m invested in College buildings and facilities over the last five years
- Integrated and secure living and studying environment on the Mile End campus

Rankings highlights

- Ranked 11th in the UK by *The Guardian* for the quality of our research in the last Research Assessment Exercise
- In the top 20 universities in the UK and in the top 120 in the world according to *The Times Higher Education 2010 World University Rankings*
- In the top 300 universities in the world (out of the 1,000 best) according to the *Academic Ranking of World Universities* (known as the Shanghai Jiao Tong ranking)
- Ranked 7th in the UK for graduate starting salaries by *The Sunday Times* in 2010

Queens' Building (top left) and the Clocktower (right)

Welcome to Queen Mary, University of London

Teaching facilities and learning resources

You will be able to make use of excellent facilities and learning resources during your studies. We have listed a few of them below.

Specialist facilities

Whatever your area of study or research, we provide a range of specialist facilities. Our engineering and materials science students, for example, have access to wind tunnels, thermofluids engineering facilities, electrospray technology labs, a cell and tissue engineering suite and the latest electron microscopes. Biological and chemical science students have access to facilities for chromatography, spectrometry, magnetic resonance imaging, specialist resources for genomics and bioinformatics as well as glasshouses, controlled environment rooms, and marine and freshwater aquaria. Laboratories for our engineering and computer science students include our Augmented Human Interaction Laboratory (which features motion capture and virtual reality systems) as well as multimedia, digital signal processing, antenna and digital music labs.

We also offer a range of postgraduate-only facilities. Electronic engineering and computer science students, for example, have access to their own computing lab and the exclusive use of the top-floor of the Informatics Teaching Laboratory outside of scheduled lab sessions.

You can find out more about our specialist resources and facilities in each of the School's sections further on this prospectus.

GE Fogg building foyer

Mile End Library

The Mile End Library is a great place to study. A recent major refurbishment has created new spaces for studying, an archives reading room, self-service issue and return points and a café, as well as a dedicated research postgraduate reading room. You will have access to the technology you need to support your learning, including networked PCs and wireless access for laptops. The science and engineering collection contains both print and e-books, reference volumes, a range of print and e-journals, and access to specialist databases and web resources.

Mile End Library (and right)

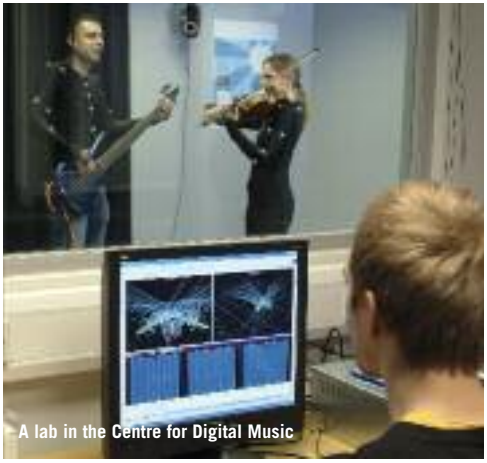
Our Academic Liaison Librarians have an in-depth knowledge of subject-specific resources. They can help you find the information you need and can also support your research skills, including help with communicating your research and making it widely available.

The Library is open seven days a week during term-time, and until midnight during the week. It also provides 24-hour access over the main summer revision and exam period. In addition, most electronic resources are available day and night, on and off campus, to all Queen Mary students.

To find out more about what we offer, visit the Library website at www.library.qmul.ac.uk

Other libraries

Our London location means that you will be close to the greatest concentration of university, national and specialist libraries in the UK, including libraries at the Natural History Museum, the Science Museum, the Royal Astronomical Society, the Royal Statistical Society, the London Mathematical Society and the Institute of Chemical Engineers. We encourage you to take advantage of these resources as well as the excellent collections in other University of London colleges.



A lab in the Centre for Digital Music

Senate House

University of London

The prestigious University of London is made up of 19 individual colleges – including Queen Mary – all of outstanding quality. As part of the University of London you will belong to the largest and most diverse university in the UK with access to excellent additional resources.

Rich history

Queen Mary, University of London was formed from the merger of Queen Mary College and Westfield College, both member colleges of the University of London. The Mile End Campus is historically the home of Queen Mary College, which began life in 1887 as the People's Palace, a philanthropic centre for the intellectual and cultural improvement of east Londoners. Westfield College was founded in 1882 in Hampstead as a pioneering college for the higher education of women.

In 1995 the College merged again, this time with two leading medical colleges, to create Barts and The London School of Medicine and Dentistry: The London Hospital Medical College, England's first medical school, was established in 1785, and St Bartholomew's Hospital Medical College was established in 1843.

In recent years the School of Medicine and Dentistry has seen many exciting developments. Over £100m has been invested in creating state-of-the-art facilities in Whitechapel and West Smithfield to make east London a place which attracts world-class researchers.

Research and teaching excellence in science and engineering

From developing more interactive elements for watching sport on television, the discovery of a rare bat species in Sumatra to searching for potentially habitable 'exo-planets', we are involved in exciting research which has a lasting impact across a wide range of disciplines.

At Queen Mary we have an impressive track-record of winning generous research funding, which in today's higher education environment ensures that we continue to excel across the board. Our academics make a real difference to many different fields through publications, papers in key journals, participation at conferences and public events, and work in the media.

The latest Research Assessment Exercise (RAE) confirmed Queen Mary's position as a leading, research-focused institute (see table right). These results place us ahead of several University of London colleges and many Russell Group institutions.

Research with impact

We want our research to have a meaningful and lasting impact. That means producing work that responds to global challenges – sustainable energy, global security, climate change, and health issues such as the aging population; it also means incorporating our research into our teaching, being alert to its commercial possibilities and looking for ways to share knowledge and technology within and beyond the University.

We believe that real progress can only be made by multidisciplinary teams of researchers, not scientists working in isolation. In bioengineering and materials, for example, we bring together engineers, chemists, physicists, material scientists, and mathematicians, while in life sciences, our academics work closely with colleagues in the School of Medicine and Dentistry. Our specialist research centres act as a focus for collaboration, drawing on the strengths of multiple schools and academics working in complementary fields.

Entrepreneurial outlook

Our academics are encouraged to look for ways to commercialise technology and research. Spin-out companies originating in Queen Mary include ApaTech, which was set up in 2001 to manufacture and market synthetic bone substitutes, and was sold in 2010 for $330m, and DegraSense, a joint venture between scientists in the schools of Biological and Chemical Sciences and Engineering and Materials Science, which seeks to use protease biosensor technology to treat inflammatory conditions.

Engaging the community

Our Computer Science for Fun programme is an international campaign to get people interested in computer science. In one year alone, its website received 15 million hits worldwide. By engaging the local community and the younger generation in this way, we raise the profile of our work, attract good students to our courses and, most importantly, get people excited about science and engineering.

Antenna Measurement Laboratory

Top 20 universities in *The Guardian* Research Assessment League Table:

Ranking	University
1	The University of Cambridge
2	The University of Oxford
3	London School of Economics
4	Imperial College
5	University College London
6	The University of Manchester
7	The University of Warwick
8	The University of York
9	The University of Essex
10	The University of Edinburgh
11	**Queen Mary, University of London**
12	The University of St Andrews
13	The University of Bristol
14	University of Durham
15	The University of Southampton
16	The University of Leeds
17	The University of Sheffield
18	The University of Bath
19	The University of Lancaster
20	King's College London

Living in London

London is one of the world's most culturally rich and inspiring cities. You can take advantage of some of the best resources in the country – such as special collections, libraries, and museums – that will feed into and complement your studies. London has 360 public libraries and a huge range of independent specialist collections. The city houses nearly a third of all the UK's archives and holds over 20,000 cubic metres of local authority records alone.

Living in London also gives you access to outstanding art galleries, theatre, and live music, as well as first-class sporting and other recreational facilities. There are over 250 museums and galleries, and the major museums, such as The Science Museum, Natural History Museum, V&A Museum and galleries such as Tate Modern, Tate Britain and the National Gallery offer free entry.

Our Mile End campus is located one mile from the City of London (hence the name) and a similar distance from the financial district of Canary Wharf. With so many businesses located in the nation's capital you will be well-placed to build your connections with the worlds of innovation and commerce.

You can find a map of our Mile End campus and the surrounding area on page 130.
To find out more – from upcoming festivals to the location of your local pub, visit: www.timeout.com/london

Our home in the east

"London has been called a 'world in one city' and that's not just empty rhetoric."

Lonely Planet 2011

Nowhere is this more true than in east London, the exciting and culturally diverse area that is home to Queen Mary.

The hub of London's creative and cultural community, east London represents the best of the city – rich in history, yet always looking to the future, and ethnically diverse, while retaining a uniquely British character.

At Queen Mary we're proud of our roots in the area. In 1887, Queen Mary College began life as the People's Palace, a philanthropic centre for the education of east Londoners. We still work closely with our local community today, for example, running a free Legal Advice Centre.

Olympics legacy

The Olympic Games 2012 will have taken place by the time you arrive at Queen Mary, but the impact they make on the surrounding area will be apparent for years to come with better transport links, improved infrastructure and first-class sporting facilities – some of which will be available for use by the public.

The Olympic Park is only a couple of miles from our Mile End campus, and one stop on the tube. At the time of going to press, the plan is to transform it into one of the largest urban parks created in Europe for more than 150 years. For more information, see: www.london2012.com

London 2012 Olympic Stadium (visualisation)

London 2012 Olympic Bridge (visualisation)

Stratford International Station – next to the London Olympic Park and the new Westfield shopping centre (one stop from Mile End)

Image courtesy of Clive Power **www.clivepower.com**

East London location

Green space

London is one of the greenest cities in Europe and the area around Mile End is no exception. Next to the campus is Mile End Park and a short walk away is Victoria Park, one of London's oldest parks. Known in Victorian times as the 'People's Park', it provided much-needed green space for the local community and became a centre for political meetings. Today, the park hosts music festivals, open-air theatre and is a great place to relax.

Victoria Park

Shopping

Europe's largest shopping centre, the new Westfield shopping centre at Stratford is only one stop away on the tube. If you're looking for something more unique, you can explore the boutiques, vintage shops and weekend market at nearby Brick Lane or, a little further afield, the arts and crafts market at Spitalfields.

See: http://uk.westfield.com/stratfordcity
• www.visitspitalfields.com

Spitalfields market

Image courtesy of Herry Lawford

The Whitechapel Gallery

Music
There is always live music in the capital, and it's often free. Nearby, you'll find large and well-known venues like 93 Feet East on Brick Lane and the O2 Arena. There's also live music in local pubs and bars.
See: www.93feeteast.co.uk • www.theo2.co.uk

Food and eating out
London is a food lover's paradise, with cuisine from around the world, and restaurants to suit all budgets. There are also great fresh food markets, including Queen Mary's very own Farmers' Market. Held every week, you can shop for free range, organic and locally farmed produce on the Mile End campus.


Vibe Bar, Brick Lane

Image courtesy of Gypsy Saskia's


Columbia Road, Flower Market


O2 Arena

Where to go

East London is really a patchwork of different areas, each with their own distinct character. Have fun exploring!

Shoreditch, Old Street and around
The heart of London's artistic community, with lots of bars and places to eat. Don't miss the White Cube gallery, the Geffrye Museum or Columbia Road flower market on Sunday mornings.
www.whitecube.com
www.geffrye-museum.org.uk
www.columbiaroad.info

Brick Lane and around
Another creative area. Also London's 'Curry Capital'– an entire street lined with Indian and Bangladeshi restaurants. Don't miss the Whitechapel Gallery.
www.whitechapelgallery.org

Docklands and Canary Wharf
Not just a business and finance centre – also home to a large shopping centre and some great bars and restaurants. Don't miss the Museum of London, Docklands.
www.mycanarywharf.com
www.museumoflondon.org.uk/docklands

Bethnal Green and Victoria Park
A vibrant residential area, with a range of good value cafés, restaurants and pubs and a daily fruit and veg market. Don't miss the V&A Museum of Childhood.
www.vam.ac.uk/moc

Mile End and around
Queen Mary's home, with a range of cafés, restaurants and student-friendly pubs. Don't miss the independent Genesis Cinema.
www.mileendwall.org.uk
www.genesiscinema.co.uk

Campus life: Students' Union, sports and socialising

Thanks to our completely self-contained campus you can have an active, varied and fun social life without ever having to leave the College. Whether you want to play sport, have a drink, meet with others of your faith or join a club or society, it's all accessible within a few minutes' walk.

Sport, health and fitness

Taking part in sport at university is a great way to keep fit, make friends and generally have a good time. Queen Mary Students' Union has over 40 sports clubs ranging from Aikido to Hockey, Fencing to Rowing.

The Students' Union has recently undergone a multi-million pound refurbishment, so in addition to the sports hall and squash court, there's a brand new health and fitness centre, Qmotion. Qmotion is home to a whole range of gym equipment including a cardiovascular zone, a resistance zone, and free weights. You can use these facilities with the expert advice of fully trained gym instructors who are on hand to give pointers on training regimes and instruct approximately 30 classes per week. There's also a women-only gym area, as well as yoga and pilates classes. Membership for the health and fitness centre is at subsidised low rates for students.

Local facilities

There is also a good range of public sports facilities in the local area, including a swimming pool, running track and tennis courts. For the more adventurous, there's the Mile End Climbing Wall, one of London's largest indoor climbing facilities.

"QMSU is consistently looking to improve the postgraduate student experience. We are expanding our range of academic, social and networking events for postgraduates and aim to establish a stronger postgraduate student voice.
We look forward to seeing you and hope you will take up some of the academic, social, sporting, volunteering and media opportunities that we offer."

Sophie Richardson, President of QMSU

Qmotion gym

The Drapers' Bar

The Students' Union runs a number of bars, the biggest of which is the recently refurbished Drapers' bar. An attractive and spacious place, during the day it is a café offering a range of tasty food options. In the evening it turns into a stylish bar with great facilities for showing live sport and, later still, a nightclub with state-of-the-art light and sound systems.

Students' Union

As a Queen Mary student, you will automatically become a member of the Students' Union (QMSU). QMSU aims to ensure that your time at university is not just about work, but also socialising and personal development.
To find out more, visit: www.qmsu.org

Eating on campus

Enjoy a great choice of cafés and restaurants on campus.

- **Mucci's –** A traditional Italian trattoria serving delicious fresh food in a relaxed environment. The menu includes two vegetarian options every day.

- **The Curve –** A coffee bar, deli and eatery serving freshly cooked international dishes and vegetarian options in a modern, relaxed, open-plan area.

- **Drapers' Bar –** Salads, burgers, and smoothies in recently refurbished surroundings.

- **Ground** – A vibrant, high-street style café serving Costa coffee, refreshing frappés and real fruit smoothies.

- **World Marché –** Costa coffee, pastries, tapas, salads, paninis and sandwiches with a great view of Regent's Canal and the Mile End park.

Ground - Mile End

Our accommodation

Queen Mary is unique among central London's universities in being able to offer a completely self-contained residential campus, with a 2,000-bed award-winning Student Village on its Mile End campus.

All College accommodation is provided in self-catered houses, flats and maisonettes. You also have access to rooms in the fully catered University of London Halls in central London. There is also a good range of private accommodation in the area around the campus. We can provide you with information on available properties, and guidance on renting privately.

We realise that you may not want to live with younger undergraduate students. That's why some of our residences are reserved for postgraduates and others are shared with final-year undergraduates. Single sex accommodation is available in non-en-suite accommodation, subject to availability.

Once you have firmly accepted your offer to study at Queen Mary, you will be sent full details of how to apply for College housing. Rooms are offered on a first-come first-served basis and there is no set deadline for postgraduate applicants. For the best chance of getting the accommodation you want, apply before the end of May in the year of your entry*.

If you live close enough to the College to commute, you will normally be expected to live at home until all those students who cannot commute have been housed. Some rooms may then become available after term begins.

Help will be given to late international applicants on their arrival in London. For more information for International students, see page 144.

Rent scales and information
The prices quoted relate to the academic year 2011-12 and are reviewed each year. Rent is payable each term in advance.

Queen Mary Student Village and Halls of Residence
Rents for single rooms range from £102-£135 per week, including gas and electricity costs.

University of London Halls
About 150 Queen Mary students live in the University of London's Intercollegiate Halls in central London, alongside students from other University of London colleges. Single rooms cost from £170 per week, including breakfast, evening meals and gas and electricity costs.

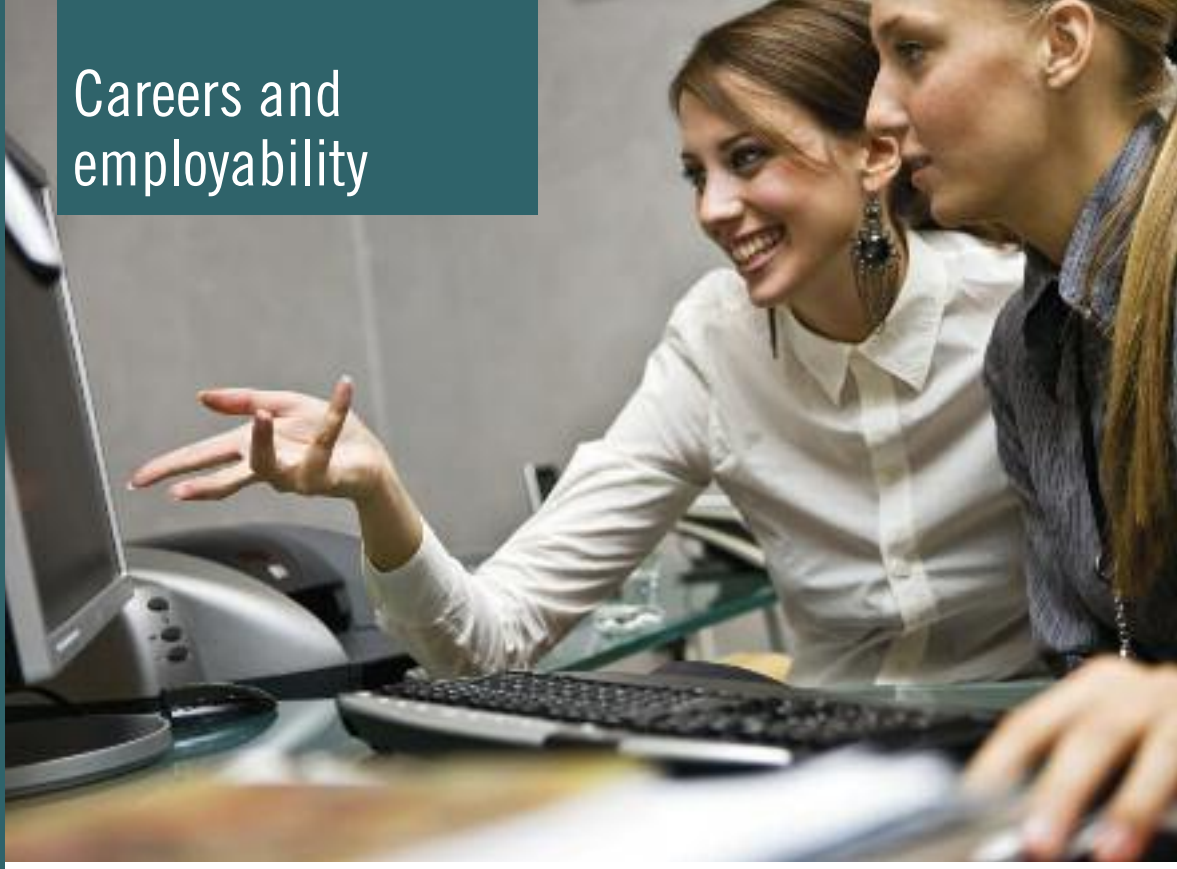
Privately rented accommodation
Many postgraduates prefer to rent private accommodation off-campus in the local area. We provide advice, information and an online search facility of privately owned accommodation available for rent. Much of this accommodation is in east or north-east London, within easy walking or commuting distance of Mile End. Rents typically range from £100-£150 per week.

Family accommodation
If you have a family, we would strongly advise you not to bring your partner and children to live with you in London until you have secured suitable affordable housing. There is very little university or hostel accommodation for students with families, and housing in the private sector can be expensive.

See what it's like
For virtual tours of our rooms and full details of all accommodation options, visit: www.residences.qmul.ac.uk

***Please note: We give priority to single, full-time, first-year postgraduates who apply before the start of the academic year in which they wish to study and who have not lived in Queen Mary accommodation before.**

Careers and employability



Whether you are mid-career and looking to consolidate your professional experience or a recent graduate wanting to explore your subject in more depth, a postgraduate qualification from Queen Mary can give you an edge in today's job market.

The value of postgraduate study

You will graduate from Queen Mary with an enhanced set of skills and knowledge attractive to employers. This will include improved cognitive and transferable skills and, if your studies are aligned to your career path, your specialist subject knowledge.

Your time with us is a great chance to reflect on where you fit in the job market. If you haven't started on your career yet, look to build your work experience alongside your studies and, whatever stage you're at, make sure you take advantage of the networking opportunities available to you on your course.

At Queen Mary we offer a vast range of opportunities and support to help you network and develop your experience, skills, and, ultimately, your CV – both in and outside of your programme.

Careers support for postgraduates

Just as important as developing your skills and knowledge, is learning to sell your postgraduate experience to employers. The Queen Mary careers team can provide training in CV and application-writing, interview technique and other employer recruitment methods – whether you are applying for internships, part-time work or permanent positions.

We also offer a range of opportunities to network with employers and past students from your academic school. Employers and training organisations that visited the campus last year, included Accenture, Barclays Capital, Cancer Research, Civil Service Fast Stream, Defence Science and Technology Laboratory, EADS Astrium, Sky and Teach First. Former students who shared their experience of the workplace, included bankers, consultants, civil servants, engineers, lawyers, scientists and politicians.

"*Postgraduate Education in the United Kingdom*, a paper published by the British Library and the Higher Education Policy Institute (Hepi), found that, three and a half years after graduation, 94% of postgraduates found work in the professions, compared to 78% of undergraduates."

The Guardian, 2010

With the majority of postgraduate courses lasting nine months, it's important that you make the most of your time here. During your induction period, you will meet with the dedicated careers adviser for your school, so that you can set your objectives for the coming months. At any time during your studies or research, you can arrange a one-to-one with an adviser to discuss your career preparation and options.

You can read more about the careers team and find job vacancies, a jobs blog and graduate career profiles, at: www.careers.qmul.ac.uk

NAME: : Anuruddha Jaithirtha

STUDIED: MSc Computing and Information Systems

CURRENTLY: Senior Executive, Ernst & Young

What do you do in your role? I work in the consultancy arm of Ernst & Young, providing IT consultancy services to corporate clients, primarily in data warehousing and business intelligence.

Why did you choose to study at Queen Mary? For a variety of reasons: the course, location, rankings and future employability all had an influence on my decision.

What did you gain from your time at Queen Mary? I learnt a broad range of skills on my MSc, mostly around programming, software engineering and databases. The general principles that I learnt have stood me in good stead. I may not directly use the specific skills that were taught, because I program in a different language, or use a different database system, but the core principles remain the same, and that's where I feel my course has been most useful. Having a degree from Queen Mary was very beneficial in job applications, because of the University's good reputation.

What are your career plans for the next five years? I plan to consolidate my skills and experience, hopefully in the UK, and would like to have a strong technical record of successful project delivery in about three to five years' time. I think it's likely that I will continue to work in consultancy around the Microsoft platform, as it is where my skills are, as well as being a strong growth market. I'd like to work with a range of technologies, rather than becoming a super-specialist in one area, since I have a broad range of interests.

NAME: Dr Ruzhen Li

STUDIED: PhD in Computer Modelling

CURRENTLY: Head of Research & Group Director at investment bank LJ Athene

Why did you choose Queen Mary and what did you learn here? I was offered a scholarship on a subject in which I was very interested. As well as developing my research skills, I learnt to get on with people from many different countries and backgrounds.

What are your career plans in the next five years? On graduating from Queen Mary, I worked as a trainee with Deloitte. After being promoted to head of research, I co-led the management buyout of our team to set up LJ Athene. We provide investment advice to private clients, charitable foundations and institutions. Over the next five years I want to build and expand our business into a global investment banking and advisory boutique, with offices in London, Hong Kong, Geneva, Miami and the Middle East."

NAME: Dr Satesh Narayana Namasivayam

STUDIED: BEng Mechanical Engineering PhD in Heat Transfer

CURRENTLY: Head of the School of Engineering at KDU University College, Malaysia

How did Queen Mary help shape your career? Queen Mary was key in helping me to articulate and communicate my ideas and, most importantly, instilled the ethical and social responsibility that engineers need. I was fortunate to have an excellent set of lecturers, who were both supervisors and mentors.

What employers look for

At Queen Mary, we have worked with employers, students and academic staff to define the skills, values and behaviours that capture the distinctive features of our learning environment and make our graduates so sought after. They include:

- the skills to influence, negotiate and lead
- curiosity and openness to change
- initiative and resilience in meeting challenges
- ability to work individually and in collaboration with others
- the skills to use technologies to access and interpret information effectively.

Our postgraduate programmes give you maximum opportunity to enhance your set of attributes and skills. Some of these you will develop through study and research; others we encourage you to build through work experience or extra-curricular activities.

Language learning
Learning a language gives you another valuable skill. The College's Language and Learning Unit offer a range from Arabic to Chinese. See www.languageandlearning.qmul.ac.uk

Queen Mary postgraduates went on to work for a variety of employers in 2010, including:

Accenture, Airbus, Balfour Beatty, Cancer Research, Citibank, Deloitte, Dyson, GlaxoSmithKline, Goldman Sachs, Harvard University, IBM, KPMG, Medical Research Council, Ministry of Defence, National Geographic, NHS, Pfizer, Procter & Gamble, PwC and Unilever.

Destination of Leavers from Higher Education Survey 2010

Work experience

Employers expect postgraduates to continue to build their skills and experience during their period of study or research. Queen Mary, with its research-rich environment, substantial campus and location between the Docklands, City and Olympic site, provides an unusually large and diverse range of opportunities.

- Many on-campus jobs, including assisting with undergraduate teaching and mentoring, helping to run conferences, building e-learning tools and stewarding halls of residence
- Easy access to hundreds of off-campus jobs across London via the QM JobOnline vacancy site
- A 'linked-up' programme that puts you in touch with professionals who work in the career area you are interested in
- 60+ annual employer recruitment and networking events
- A thriving Students' Union offering over 500 opportunities to volunteer on- and off-campus in leadership, sports, creative and community roles
- Support and training for entrepreneurs and an active entrepreneurs' society.

Off-campus, London is an exciting, vibrant city with plenty of job opportunities. Queen Mary postgraduate students undertake a range of roles from museum intern to lab assistant.

Throughout your postgraduate studies, you are welcome to make use of the information, networks and advice on offer from the Queen Mary careers team. For a full overview of services, see: www.careers.qmul.ac.uk

In 2010, on completing their course, Queen Mary postgraduates had an average salary of £33,450.

Destination of Leavers from Higher Education Survey 2010

Notable alumnus

Carl Murray

The astronomer Carl Murray is Professor of Mathematics and Astronomy at Queen Mary, University of London. He is an alumnus of the College, having graduated with a BSc in Applied Mathematics with Astrophysics in 1977 and a PhD in Astronomy in 1980.

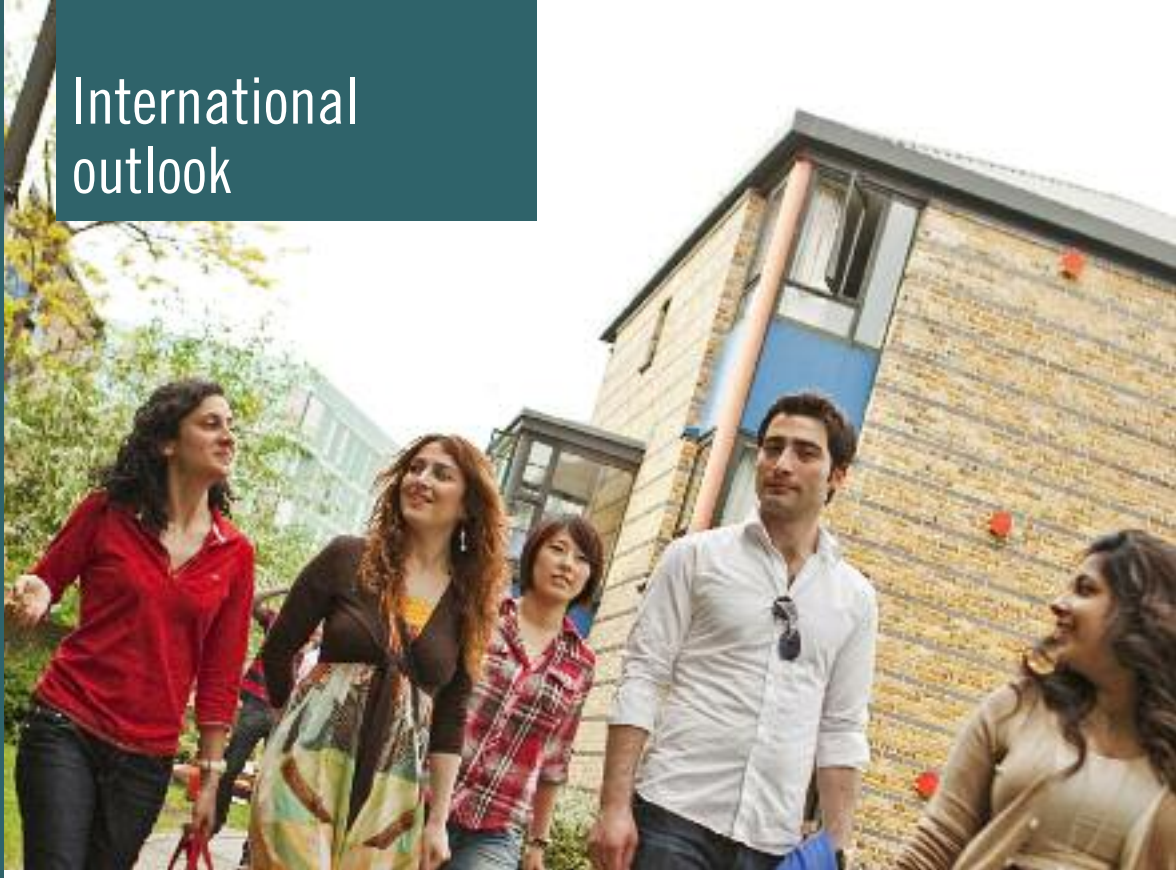
Professor Murray is well-known for being the only British member of the Cassini Imaging Team which has taken stunning photographs of the Saturn system. The team is part of the Cassini-Huygens Mission to Saturn, a joint NASA/ESA (European Space Agency) robotic spacecraft project currently studying the planet Saturn, its moons and rings.

The spacecraft was launched in 1997 and entered into orbit around Saturn in 2004. The team is responsible for designing, building, flying and collecting data from the Cassini orbiter and Huygens probe.

He is also a co-investigator on the D-CIXS experiment on the ESA's SMART-1 spacecraft. The D-CIXS is a Demonstration of a Compact Imaging X-ray Spectrometer; using radical new technology, the instrument provides superior x-ray detection, spectroscopic and spatial measurement capabilities.

Professor Murray is interested in all aspects of the dynamics of the Solar System; in particular studies of chaos and long-term stability in the Solar System. Another interest has been the analysis of Voyager images of planetary rings and small satellites. His current research areas include the application of computer algebra to problems in Solar System dynamics and the dynamics of Saturn's F ring.

International outlook



Queen Mary welcomes students from all over the world and offers a lively, multicultural environment. We currently have over 5,000 international students from more than 125 countries studying with us. We have the third highest percentage of international students and staff in the UK, and the 16th highest in the world*.

Global talent

We value the contribution that our international students make to the life of the College. As an international student you will offer different academic approaches and a range of life experience, creating a rich learning environment.

The influence of so many cultures also feeds into the social life of the College. This is reflected in the diversity of our student-run clubs and societies, which cover politics, culture, religion and a range of sports.

How we support you

Our campus provides you with a safe, secure and supportive environment in which to study. In a recent survey, our international students expressed high levels of satisfaction with the quality and cost of their accommodation (International Student Barometer 2010).

We also offer a range of specialist support services to help you feel at home, including an airport collection service and a welcome programme at the beginning of the academic year.

*Times Higher Education (THE) World University Rankings 2011

Throughout your studies, we offer immigration and counselling services, English language and study skills support, as well as fun day trips to interesting sites in London and around the UK.

Careers

If you choose to study at Queen Mary, you will enhance your career prospects in a vibrant, creative and stimulating environment. Our international graduates go on to successful careers both in the UK and overseas. To read more about our careers support, see page 20.

Scholarships

We constantly seek to attract the best postgraduate students. To help us do this, we are pleased to offer a range of scholarships to our international students. For more information on eligibility criteria and how to apply for a scholarship, visit www.qmul.ac.uk/international

Find out more

For more information on studying at Queen Mary, our overseas entry requirements, how to apply, English language support and our current tuition fees, please see pages 138-146 or visit www.qmul.ac.uk/international

Fei PENG, PhD student, School of Electronic Engineering and Computer Science

"Before coming to Queen Mary, I completed my Bachelor of Engineering at Beijing Posts and Telecommunications (BUPT) in China. I am now studying at Queen Mary for a PhD in Electronic Engineering on a scholarship from the China Scholarship Council.

"The study environment at Queen Mary is brilliant. The research and technical staff are all very kind and help students perform to the best of their ability. My colleagues are also very friendly.

"Queen Mary organises lots of activities for international students, ranging from local tours to travel to Scotland and events at Christmas, Chinese New Year etc. These activities enrich student life, as they help make you familiar with British culture."

Biological and Chemical Sciences

The School of Biological and Chemical Sciences is one of the largest departments at Queen Mary, University of London's Mile End campus, with over 70 members of academic staff and 1,300 undergraduate and postgraduate students. The School is committed to excellence in research and teaching, and offers an exciting and stimulating environment for staff and students.

Research strengths

The School provides a friendly, interactive and lively environment for research students taking PhD or MPhil degrees, and post-doctoral research.

We benefit from strong collaboration, both within and beyond the School, which provides additional insight and expertise. We also benefit from London's position as a major international centre for scientific meetings and conferences.

Research in the School spans sub-atomic to global levels of analysis, and includes research on materials chemistry and synthetic chemistry, protein structure and function, photosynthesis, cell biology, evolutionary and functional genomics, neurobiology, cognitive biology and psychology, behavioural ecology, aquatic and terrestrial ecology.

Postgraduate resources

Research resources include: an efficient and well-equipped chemical store; various workshops; excellent library and information services; a high-speed computer network that

provides fast access to a wide range of databases and other electronic sources of information; facilities for purification and analysis of macromolecules incorporating fast protein liquid chromatography (FPLC) and other chromatographies, gas chromatography mass spectrometry (GCMS), liquid chromatography mass spectrometry (LCMS), electrospray mass spectrometry, surface plasmon resonance, nuclear magnetic resonance (NMR), electron paramagnetic resonance (EPR) and electron nuclear double resonance (ENDOR), Fourier Transform Infrared (FTIR), circular dichroism (CD) and fluorescence spectroscopies, X-ray crystallography; recombinant DNA technology; state-of-the-art light and EM microscopy; glasshouses; controlled environment rooms; cold rooms; and marine and freshwater aquaria.

In 2009 the School benefited from over £1m CIF investment in state-of-the-art equipment for cell biology, structural biology and aquatic biology. The School has a Bioinformatics Hub (shared with Computer Sciences) and the College Genome Centre provides further specialist resources for genomics and bioinformatics. Some of our academic staff are based at The River Laboratory (Wareham, Dorset) and its research facilities are available for use by our students.

Scholarships/studentships

PhD studentships

The School offers around 15 research studentships annually, which Home and some EU students are eligible to apply for. These are advertised on our website at the beginning of the year, together with information on how to apply. Approximately 50 per cent of these are funded by the following research councils:
BBSRC (www.bbsrc.ac.uk)
EPSRC (www.epsrc.ac.uk)
NERC (www.nerc.ac.uk)

There are other studentships funded by the College, which International students are also eligible to apply for. In addition, the School awards Graduate Teaching Studentships, which enable students to do a PhD whilst contributing to our undergraduate teaching programmes.

Research quality indicators

The Research Assessment Exercise
Our School is distinguished by high calibre academic staff who generate a vibrant research culture and produce work that appears in high-impact multidisciplinary journals (for example Nature, Science and other top-rank specialist journals).

The results of the 2008 RAE confirmed the School's position among the UK's leading centres for Biological Sciences, with 85 per cent of our outputs assessed as being of international quality. In recent years we have focused on recruiting young and enthusiastic research-oriented staff. This will ensure the continued development of the School's exciting research environment.

Projects, funding, research grants and awards
The School attracts funding from UK research councils (BBSRC, NERC, MRC, EPSRC) and charities (Royal Society, Wellcome Trust, Leverhulme Trust), the EU, industrial collaborators and other funding agencies. The School has also benefited from substantial infrastructure funding (SRIF and CIF) having recently been awarded more than £1m for new facilities for protein structure determination, and imaging for cell biology and aquatic biology.

To get an up-to-date impression of the International recognition of the School's research, please see the News section on our website: www.sbcs.qmul.ac.uk

MSc studentships and bursaries
A limited number of College-funded bursaries to the value of £2,000 are available for award to students on our masters programmes. There are also scholarships specifically for international students worth from £1,500 a year.

Applicants to our MSc in Freshwater and Coastal Sciences are also considered for a bursary to the value of Home Fees only, funded by the Freshwater Biological Association.

All applicants are automatically considered for awards and there is no separate application form.

Enquiries about studentships/bursaries should be directed to Postgraduate Admissions Officer (sbcs-pgadmissions@qmul.ac.uk).

Further information

Postgraduate Admissions Officer
Tel: +44 (0)20 7882 3012
email: sbcs-pgadmissions@qmul.ac.uk
www.sbcs.qmul.ac.uk

General postgraduate information
Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

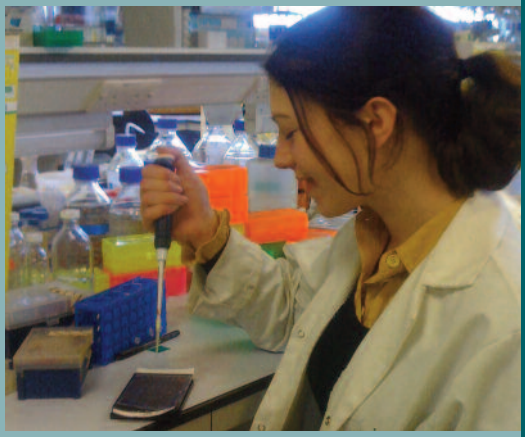
Graduate Admissions Office
Queen Mary, University of London
Mile End Road
London
E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teamb@qmul.ac.uk

Careers

Students graduating with a PhD from the School of Biological and Chemical Sciences have excellent career prospects. Many of our students continue to pursue a career in research, taking up positions as postdoctoral research fellows in laboratories based in the UK and abroad. Some progress to become independent research scientists, heading up their own research groups in universities or research institutes and going on to train the next generation of research scientists. Others take up research positions in industry (such as agrochemicals and pharmaceuticals) or move on to a teaching career in schools and other educational institutions. For some, a PhD is a qualification that provides a strong academic foundation for careers in business, the civil service, health care, journalism and more.

Students who have recently graduated with one of our masters degrees have gone on to do further research in the UK and abroad, including PhD positions at Queen Mary, Oxford University, University College London and in the USA and New Zealand. Other students have secured employment in industry and academia, including environmental consultancies, UK and overseas government agencies, the pharmaceutical industry, a global oil field services provider and as the head of a department at a university in Guyana.

Graduate profile: Claire Sarell



Studied: PhD researching the Copper-Amyloid-beta-Peptide Complex of Alzheimer's Disease: Affinity, Structure, Fibril Formation and Toxicity

Currently: Postdoctoral fellow at Leeds University researching the role of RNA aptamers as research tools and diagnostic reagents in amyloid disease.

Why did you choose Queen Mary for your postgraduate study?
I was impressed by the nuclear magnetic resonance (NMR) facility and the calibre of the academics in the School of Biological and Chemical Sciences. The PhD programme was well-structured and there was an excellent supportive and encouraging atmosphere from the academics in the department.

What did you gain from your time at Queen Mary?
My predominant gain was excellent experience in a wide range of techniques that were crucial to my PhD. Having access to specialist publications – NMR, electron paramagnetic resonance spectroscopy, transmission electron microscopy – was extremely helpful. I also developed a clear idea of what a career in academia would involve. Throughout my time at Queen Mary I was supported and encouraged by my supervisor and other academics who offered regular meetings and insightful advice. Transferable skills training and careers advice were both extremely helpful.

What are your career plans in the next five years?
My postdoctoral position lasts for three years. After that I hope to have sufficient publications to apply for a fellowship position. This will allow me to remain in academia and continue research into amyloid diseases such as Alzheimer's disease.

Degree programmes

MSc Aquatic Ecology by Research

One year full-time, two years part-time

Programme description

The MSc Aquatic Ecology by Research offers students a comprehensive practical training with a good proportion of time spent in the laboratory and field. The content covered is closely aligned to the MSc Freshwater and Coastal Sciences (see over), however this programme places more of an emphasis on practical work, rather than formal tuition such as lectures.

You will develop all the skills necessary to undertake further academic or applied research through completion of an extended project. This will be aligned to cutting-edge research taking place in the Centre for the Aquatic and Terrestrial Environment in the School of Biological and Chemical Sciences. Students will be encouraged to share their work through publication in relevant journals.

Programme outline

You will take three core modules and an associated one-week residential field training course taught by experts in aquatic ecology from the School of Biological and Chemical Sciences and the Geography Department.

Core modules: Aquatic Ecosystems: Structure and Function • Aquatic Systems: Hydrological, Hydrochemical and Geomorphological Processes • Statistics for the Biosciences

Field training course: an introduction to key field skills held at the Freshwater Biological Association's River Lab on the River Frome, Dorset.

Individual research project: Comprises a literature review, written thesis, seminar presentation, and oral examination.

Assessment

The taught element of the programme comprises 20 per cent of your final mark determined by continuous assessment. The field course is not formally assessed, but

provides further training in field techniques introduced during the two aquatic systems modules.

Your extended project makes up the remaining 80 per cent of your mark. You will be assessed on the following: literature review and project plan (20 per cent), student contribution and work ethic (10 per cent), oral presentation (10 per cent) and thesis (60 per cent).

Entry requirements
Undergraduate degree (minimum upper second class honours) in a relevant subject such as environmental science, biology, chemistry or geography. Individuals with relevant professional qualifications or other experience and qualifications will also be considered. Candidates will be interviewed as part of the admission procedure.

International students, please see the 'international students' section on page 144.

Further information
Postgraduate Admissions Officer
Tel: +44 (0)20 7882 3012
email: sbcs-pgadmissions@qmul.ac.uk

For informal enquiries, please contact
Dr Jonathan Grey
Tel: +44(0)20 7882 7819
email: j.grey@qmul.ac.uk

MSc in Freshwater and Coastal Sciences

(Jointly taught with the Department of Geography)
One year full-time, two to five years part-time

Programme description
Aquatic ecosystems are vital global resources. However, issues such as habitat degradation, pollution, species introductions and climate change, severely threaten their ecological integrity and sustainability. The MSc in Freshwater and Coastal Sciences (FACS) aims to provide students with the necessary skills to

Matteo Dossena, MSc Aquatic Ecology by Research

"The MSc Aquatic Ecology by Research is, in my opinion, the best first step in a career in ecological sciences.

"The programme is led by a prestigious team of freshwater and marine scientists, and forms part of a vibrant postgraduate community.

"I chose Queen Mary for three main reasons: first, because it is based on practical application rather than formal lectures; second, because the available research topics cover contemporary ecological issues; and finally because independent thought is enthusiastically encouraged by supervisors. Also, the joint venture with the Freshwater Biological Association (FBA) and the facilities provided by the River Laboratory in Dorset, played an important role in my decision.

"I am currently involved in an ambitious experimental project on the effect of warming on freshwater ecosystems using mesocosm facilities at the FBA River Lab. This has given me the opportunity of joining a working team of international scientists, giving me a real taste of the science behind the textbooks.

"I plan to carry on with a PhD, so far this course has been excellent preparation for a successful career in science."

Degree programmes

understand and tackle these issues, by integrating ecology with hydrology and geomorphology. Emphasis is placed on practical skills and field experience.

The Centre for Aquatic and Terrestrial Environment (CATE) is an interdisciplinary collaboration between the School of Biological and Chemical Sciences and the Department of Geography. The staff within CATE have considerable multi-disciplinary expertise in aquatic ecosystem sciences which is further complemented by staff from organisations such as the UK Environment Agency, NERC Centre for Ecology and Hydrology, The Freshwater Biological Association and the conservation agencies.

Programme outline

Semester 1: Four core two-week modules and a one-week field module: Aquatic Ecosystems: Structure and Functioning • Statistics for the Biosciences • Hydrological, Hydrochemical and Geomorphological Processes • Science, Policy and Management

Semester 2: Four module options from those listed below. Habitat module options include: Streams and Rivers • Lakes and Ponds • Estuaries and Coastal Systems

Specialist organism options include: Macrophytes • Plankton • Marine Invertebrates • Fishes

One of the four module options can be selected from the following School of Geography modules: Managing Aquatic Environments • Managing Water Resources • River and Floodplain Appraisal and Management

Assessment

The taught element of the programme comprises 66 per cent of your final mark determined by continuous assessment. The research project (33 per cent) is assessed via a 12,000-15,000-word dissertation.

Entry requirements

A second-class honours degree (or the equivalent from an overseas university) in a relevant natural sciences subject. Applicants with relevant professional experience in science or environmental management will also be considered.

International students, please see the 'International students' section on page 144.

Scholarships and bursaries

The programme is supported by a limited number of bursaries, including one from The Freshwater Biological Association (www.fba.org.uk/).

Recent graduate destinations

These include: • Environment Agency • ENSIS Ltd • Portsmouth Water • Bureau Veritas • Royal Society for the Protection of Birds • Nunatsiavut Government – Fisheries Research and Management • Open University

Further information

Postgraduate Admissions Officer
Tel: +44 (0)20 7882 3012
email: sbcs-pgadmissions@qmul.ac.uk

MSc in Marine Ecology and Environmental Management

One year full-time or part-time over a maximum of five years

This programme is taught jointly by the School of Biological and Chemical Sciences at Queen Mary, University of London and the University of London Marine Biological Station at Millport, Isle Of Cumbrae, Scotland (www.gla.ac.uk/centres/ marinestation/).

Programme description

The aims of this programme are to:

- Develop a strong interdisciplinary understanding in marine ecology and marine environmental management.

- Provide structured training in research techniques and practical skills, including in systematics (biodiversity), statistics, experimental design, project planning, monitoring, modelling and scientific writing that will engage with user needs.
- Provide a foundation for further PhD research, or for prospective employment with marine environmental protection and conservation agencies, overseas development agencies, national and local government, the water industry, the fisheries sector, environmental consultancies, elements of the tourist industry and national and international non-government organisations.

This programme covers ecological issues and environmental management in marine science. It is taught in two institutions with roughly six months in London and six months in Millport. The School of Biological and Chemical Sciences at Queen Mary has a long tradition of working in aquatic biology. It is a large and diverse institution with expertise in whole organism biology and molecular sciences. The University Marine Biological station at Millport is a smaller specialist marine institution with a range of laboratory and research vessel facilities and associated specialist staff.

Programme outline

Core modules

At Queen Mary: Benthic and Planktonic Processes • Marine Invertebrate Zoology • Marine Pollution • Statistics for the Biosciences • Project 1

At Millport: Coastal Zone Management • Fisheries Biology • Project 2

Optional modules

At Queen Mary: Estuaries and Coastal Systems

At Millport: Coral Reef Monitoring and Management (taught in Sharm el Sheikh, Egypt) • Marine Microbiology • Turtles, Seals, Whales and Dolphins

Ben Radbone, MSc Freshwater and Coastal Sciences

"Having finished my degree and then spending some time overseas, I was keen to further my studies. I attended an open day to find out more about the MSc in Freshwater and Coastal Sciences, and was extremely impressed with the facilities on offer, as well as the enthusiasm of both lecturers and students. I was also aware of the excellent reputation Queen Mary has as a research institution.

"The programme's interdisciplinary modular format has allowed me to tailor my studies to areas of particular personal interest, while also gaining an understanding of the whole spectrum of freshwater and coastal sciences.

"One of the strengths of the programme is the high staff to student ratio; I have found the lecturers both approachable and supportive. The large amount of practical, field and laboratory-based work has given me a skill set that could apply to both the work place and further postgraduate study."

Degree programmes

Assessment
All taught and field modules will be equally weighted at one-twelfth (8.33 per cent) of the total mark. Each of the two projects will be weighted at two-twelfths (16.67 per cent) of the total mark. Each taught module will be assessed by one or more of: open-essays, practical reports, laboratory or fieldwork note books, presentations and traditional exams.

Entry requirements
A minimum of a second class honours degree (or the equivalent from an overseas university) in a relevant subject such as environmental science, biology, chemistry or geography will be required. Preference will be given to candidates with an upper second class or first class degree. Applicants with relevant professional experience in marine science or environmental management will also be considered.

International students, please see the 'international students' section on page 144.

Recent graduate destinations
Graduates from this programme have taken up a range of exciting positions, for example with environmental consultancies, UK and overseas government agencies, marine and other environmentally related industries and water authorities. Others have continued on to further research in the UK and worldwide, including PhD positions.

Further information
Postgraduate Admissions Officer
Tel: +44 (0)20 7882 3012
email: sbcs-pgadmissions@qmul.ac.uk

MSc in Chemical Research

One year full-time, two years part-time

Programme description
The MSc in Chemical Research at Queen Mary offers you the opportunity to make a contribution to the fascinating world of modern chemistry, by spending a year working on a major individual research project.

This research work is supplemented by lecture modules and seminars, and successful completion of the programme leads to the award of an internationally recognised masters qualification.

This programme provides a comprehensive preparation for students wishing to progress onto a research career (bridging the gap between the lecture-dominated programme of a typical undergraduate BSc degree and the research intensive PhD degree), but the qualification can also be a real asset for those wishing to pursue other careers in industry, or in education. Training is given in a wide range of techniques to enable candidates to build up a substantial portfolio of experimental skills and thereby tackle more extended research and development projects with increased confidence. The practical work is also reinforced by lecture modules explaining the underlying theoretical basis of various research methods and techniques, and other aspects of advanced chemistry.

Programme outline
The major part of the programme is a research project on a topic agreed in consultation with the MSc programme coordinator. This practical work will generally provide training in a variety of specialised techniques appropriate to your chosen area of research and is carried out in the main research laboratories, under the supervision of a member of academic staff.

The taught component of the degree programme consists of two lecture modules, usually selected from the range of advanced undergraduate chemistry modules offered by the School.

Assessment
The taught modules include assessed coursework components, but the main assessment is by examination in May/June. For the research project you are assessed on

the basis of a dissertation, which you submit towards the end of the programme, a presentation of your research work at a seminar and an oral examination of your dissertation and the associated project topic.

Entry requirements
The normal minimum requirement is a second class honours degree in chemistry, or with chemistry as a major element (or equivalent international qualification).

International students, please see the 'international students' section on page 144.

Recent graduate destinations
Many graduates from this programme have gone on to do further research in the UK and abroad, including PhD positions at Oxford University, University College London, Birmingham and in the USA. Other students have secured employment in industry and academia, including:

• Schlumberger, a leading global oil field services provider • Manager of a cosmetics company in China • Pharmaceutical industry in the USA • National Hellenic Research Foundation, Athens • Head of Chemistry, University of Georgetown, Guyana

Further information
Postgraduate Admissions Officer
Tel: +44 (0)20 7882 3012
email: sbcs-pgadmissions@qmul.ac.uk

For informal enquiries, please contact
Peter Wyatt, Programme Director
Tel: +44 (0)20 7882 3267
email: p.b.wyatt@qmul.ac.uk

Carolyn Bromley, MSc Marine Ecology and Environmental Management

"Queen Mary was an obvious choice for me: The University has an excellent reputation for research and some of its alumni have gone on to become important figures in the marine field; the facilities and resources are also excellent and the department staff enthusiastic experts; last but not least, there are not many courses where you get to spend several months based at a working marine station.

"The MSc has given me the opportunity to build on my knowledge of marine biology gained at undergraduate level. Working with excellent supervisors has taught me a huge amount and enabled me to gain confidence in my chosen field.

"As a mature student, I came to this quite late and it represents a complete change of direction from my previous work. I am currently exploring both PhDs and employment options for when I graduate. Watch this space as I intend to make the most of this opportunity!"

Research

We welcome postgraduate students and visiting research fellows who wish to undertake research in our areas of interest (see below). Research students are registered for a University of London degree (PhD) and work under the supervision of members of academic staff.

Students may receive financial support (research studentships) offered by the research councils (including CASE studentships in collaboration with an industrial sponsor). A limited number of College studentships are also available.

Entry requirements

Students with upper-second class (or better) BSc honours degrees or equivalent are eligible to apply for admission to research degrees.

International students, please see the 'international students' section on page 144.

Research areas

- **Biological and experimental psychology**
- **Ecology and behavioural biology**
- **Evolutionary and organismal biology**
- **Materials chemistry and interfaces**
- **Mechanistic and structural biology**
- **Synthetic chemistry**

Biological and experimental psychology

http://psychology.sbcs.qmul.ac.uk/index.html

Research in this area focuses on the ultimate (evolutionary) and proximate (genetic, developmental and neurobiological) mechanisms responsible for cognition and behaviour.

A central consideration for this group concerns cognitive evolution and the biological basis of human social behaviour. We also place a strong emphasis on the experimental approach to research problems in these fields of psychology.

Recent topics in which world-class work has been conducted includes physical reasoning and social cognition in corvids, colour perception in bumblebees, the transmission of cultural information in humans using evolutionary models, the biological origins of human sexual orientation, sex differences in cognition, the use of zebra fish as a model behavioural assay of addiction, visual attention and search in humans and non-human animals, the role of cannabinoid signalling in neural processes, social evolution in mole rats, gene-brain interaction in mammalian reproductive behaviour, the utility of *Drosophila* models of circadian rhythms, face processing and imitation, and the philosophy of mind.

Ecology and behavioural biology

www.sbcs.qmul.ac.uk/research/researchgroups/ecologybiology/index.html

Within this group are two major research themes of international significance: aquatic ecosystems and behavioural/evolutionary ecology, particularly of social animals. Together, these themes give a distinctive and strong coverage of modern ecosystems and organismal ecology. Included within the aquatic ecosystems theme is one of the strongest freshwater ecology research groups in any British University.

Research by the group includes population and community ecology, empirical and theoretical aspects of food web structure and function, the application of stable isotopes to aquatic ecology, biogeochemical processes, including the production of greenhouse gases from rivers and wetlands, and studies of acidification and eutrophication.

We also have leading experts in the biogeochemistry and ecology of estuaries, coastal margins and salt marshes. Included in the behavioural ecology of social animals theme, we have world-leading research on the foraging biology of bees, the social organisation and mating systems of communally roosting bats, and the (eu)sociality of the mole rats. We also have excellence in the behaviour, ecology, management and conservation of wild mammals, on the role of termites in the productivity and sustainability of tropical agriculture, and on the role of pathogens and parasites in sexual selection and behaviour in insects.

Research areas

Evolutionary and organismal biology

www.sbcs.qmul.ac.uk/research/researchgroups/evolutionaryandorganismalbiology/index.html

The Evolutionary and Organismal Biology Group is internationally recognised for using post-genomic approaches to investigate the evolution and functions of genes and proteins at an organismal level using a range of model organisms, including plants, invertebrates, fish and mammals. An underlying theme is a recognition of the importance of comparative and functional genomics in modern biology. It encompasses research on chromosome evolution in plants, transposable elements in insects, developmental biology (using vertebrates and invertebrates as model systems), molecular neurobiology, behavioural genetics (eg circadian biology of *Drosophila*) and population genetics of humans and other animals.

This research utilises a range of methods including bioinformatics, analysis of cell and tissue structure, analysis of gene and protein expression and the impact of gene-knockout on phenotypes, *in vitro* physiology and pharmacology and analysis of whole-organism behaviour.

Materials chemistry and interfaces

www.sbcs.qmul.ac.uk/research/researchgroups/materialsandinterfaces/index.html

Research in the materials and interfaces area combines expertise in synthetic methodology along with a wide range of sophisticated analytical techniques in order to design and develop new materials, to investigate and predict their properties, and to characterise interfacial structure and chemical reactions at surfaces. See also the Centre for Materials Research website: www.cmr.qmul.ac.uk

Mechanistic and structural biology

www.sbcs.qmul.ac.uk/research/researchgroups/mechanisticandstructuralbiology/index.html

Mechanistic and structural biology has traditionally been strong at Queen Mary, and activity in this area has accelerated over the past five years.

We have particular research excellence in: (i) photosynthesis and bioenergetics at the molecular and cellular levels; (ii) protein structure and structure/activity relationships in peptides, proteins and enzymes; and (iii) in the synthesis of biologically relevant molecular systems.

We use a variety of approaches including cloning and over-expression, mechanistic enzymology and structure determination utilising X-ray crystallography and NMR spectroscopy. We have modern and well-equipped facilities for these techniques and also for a variety of other spectroscopic approaches, including circular dichroism, both continuous wave and pulsed EPR and ENDOR, confocal microscopy, Fluorescence Recovery After Photobleaching (FRAP) and fluorescence spectroscopy.

Synthetic chemistry

www.sbcs.qmul.ac.uk/research/researchgroups/syntheticchemistry/index.html

Synthetic chemistry at Queen Mary has seen resurgence in recent years with the appointment of a number of new staff. Our main interests lie in: (i) the development of new synthetic and catalytic methodology; (ii) the total synthesis of natural products and their analogues as drug candidates; (iii) molecularly imprinted polymers for application as artificial receptors and catalysts; (iv) ultrafast electron transfer and (v) molecular machines for application to the synthesis of complex molecules and materials. We have excellent laboratories to undertake this research in the state-of-the-art Joseph Priestley Building. We

are also supported by outstanding research facilities, including an array of NMR, EPR and ENDOR and mass spectrometers, single crystal X-ray crystallography and a range of analytical facilities commensurate with contemporary synthetic chemistry.

Staff research interests
www.sbcs.qmul.ac.uk/people/academicstaff/index.html

Isaac Abrahams BSc(CNAA) PhD(City) CChem MRSC
Senior Lecturer in Inorganic Chemistry
Solid-state chemistry; crystallography, materials chemistry, solid electrolytes, glasses, biomedical materials

John Allen BSc PhD(Lond)
Professor of Biochemistry
Regulation of photosynthesis by protein phosphorylation; redox signalling in cell evolution

Rachel Ashworth BSc(Birmingham) PhD(Reading)
Lecturer in Oral Biology (Physiology)
The role of calcium signalling in nerve and muscle development

Christopher Bray MChem DPhil(Oxon)
Lecturer in Synthetic Organic Chemistry
Organic chemistry, total synthesis and new synthetic methodology

Caroline Brennan BSc PhD(Lond)
Lecturer in Molecular genetics
Neurobiology of drug addiction and cell signalling during development

Lars Chittka PhD(Berlin)
Professor of Sensory and Behavioural Ecology
Sensory physiology, learning and evolutionary ecology

Brendan Curran BA PhD(Dublin)
Senior Lecturer in Molecular Genetics and Biotechnology
Yeast biotechnology

Ronald Cutler MSc PhD(Lond) CIBiol CSc FIBMS FIBiol
Senior Lecturer in Biomedical Science
Infectious diseases and pathology with particular emphasis on novel treatments against multiple drug resistant microbial pathogens

Adrian Dobbs BSc PhD(Lond)
Senior Lecturer in Organic and Biological Chemistry
Synthetic organic chemistry: methodology and total synthesis

Tiina Eilola BSc(Tartu, Estonia) MSc PhD(Canterbury)
Lecturer in Psychology
The recognition of emotional content in bilinguals' different languages

Maurice Elphick BSc PhD(Lond)
Professor of Animal Physiology and Neuroscience
Neurobiology and evolution of signalling molecules

Nathan Emery BSc Hons(Central Lancs) PhD(St And)
Royal Society University Research Fellow and Senior Lecturer in Cognitive Biology
Comparative cognition and the evolution of intelligence

Genoveva Esteban BSc MSc PhD(Madrid)
Lecturer in Eukaryotic Microbiology
Microbial ecology, taxonomy and functional groups of free-living protozoa in fresh waters, soils and marine habitats

Matthew Evans BSc(Bristol) PhD(Cambridge)
Professor of Ecology and Head of School
Behavioural ecology, conservation and understanding how to predict the ecological impacts of environmental change

Chris Faulkes CBiol MIBiol PhD(Lond)
Reader in Evolutionary Ecology
Molecular Ecology; Social evolution in cooperatively-breeding mammals

Staff profile: Professor Maurice Elphick

Professor of Animal Physiology and Neuroscience

"I am interested in the evolution and functions of molecules that mediate communication between nerve cells in the brain. A particular focus is the endocannabinoid system, a signalling system in the brain that is affected by the drug cannabis. Our research, funded by grants from BBSRC, MRC, Wellcome Trust and Leverhulme Trust, has helped to establish how this system works, when it first evolved, and how it can be targeted to treat medical disorders such as chronic pain.

"I decided to work in this field for two reasons: a desire to learn more about how nervous systems orchestrate the astonishingly complex behaviour of humans and other animals; and a conviction that research on all forms of life is absolutely essential for understanding human biology and for maintaining life on earth.

"I hope my research work helps me transmit the joy of learning and discovering new things about the natural world to the students I teach. Discovering things yourself really helps you appreciate how valuable knowledge and understanding are.

"London is one of best cities in the world to do scientific research because there are so many opportunities to collaborate and learn from other scientists. Queen Mary provides a friendly, supportive and interactive environment that enables scientists to do world-leading research."

Research areas

Bland Finlay BSc PhD(Stirling) FRS FRDSSL
Professor of Microbial Ecology
Ecology and physiology of free-living protozoa; dimensions and dynamics of biodiversity at the microbial level

Stephen Goldup MChem(Oxon) PhD(London)
Royal Society Research Fellow
Organic synthesis and methodology; molecular nanotechnology; physical organic chemistry

Jonathan Grey BSc PhD(Lanc)
Senior Lecturer in Freshwater Biology
Ecology of lakes and aquatic-terrestrial links

John Gurnell BSc PhD(Exon)
Professor of Ecology
Behaviour and ecology; conservation biology; wildlife management

Peter Heathcote BSc PhD(Lond)
Professor of Biochemistry
Protein cofactor interactions in photosynthetic reaction centres, respiratory chain complexes and enzymes involved in tetrapyrrole biosynthesis

Andrew Hirst BSc PhD(Soton)
Senior Lecturer in Marine Biology
Biological oceanography, marine zooplankton ecology

Rob Hughes BSc(Wales) PhD(R'dg)
Senior Lecturer in Marine/Estuarine Ecology
Marine and estuarine benthic ecology and conservation

Paul Hurd BSc PhD(Sheff)
Lecturer in Molecular Biology and Biochemistry
Epigenetics, epigenomics, DNA methylation, histone modifications, post-translational modifications

Bob Janes BSc MSc PhD(Lond)
Senior Lecturer in Biochemistry
Structure-function studies of voltage-gated ion channel toxins

Keith Jensen MSc(Dalhousie) PhD(Humboldt)
Lecturer in Developmental and Comparative Psychology
Development and evolution of cooperation

John Iwan Jones BSc PhD(Liverpool)
Research Leader in Freshwater Ecology
Pure and applied freshwater ecology; ecosystem structure and functioning; biological assessment of human impacts on freshwater ecosystems

Rob Knell BSc PhD(Liverpool)
Senior Lecturer in Evolutionary Biology
Transmission dynamics of parasites

Norbert Krauss Diploma in Chemistry PhD(Cologne)
Senior Lecturer in Structural Biology
Three-dimensional structures of photosystems I and II of organisms which perform water-oxidising photosynthesis; phytochromes

Igor Larrosa BSc PhD(Barcelona)
Lecturer in Synthetic Organic Chemistry
Gold and palladium homogeneous catalysis

Nathalie Lebrasseur BSc MSc(Toulouse) PhD(IECB Bordeaux)
Lecturer in Organic Chemistry
Natural products synthesis, development of new methodologies for organic synthesis and mechanically-interlocked molecular architectures

Steve Le Comber BSc PhD(Lond)
Lecturer in Anatomy
Evolutionary modelling; mathematical approaches to animal foraging

Andrew Leitch BSc PhD(Bris)
Professor of Plant Genetics
Evolutionary consequences of polyploidy in plants

Ewan Main BSc Hons(Edinburgh) PhD(Cantab)
Lecturer in Biochemistry
Molecular Biophysics – the design, folding and molecular interactions of proteins

Colin Malcolm BSc(Aberd) PhD(Manc)
Lecturer in Molecular Genetics
Insect genomics; molecular genetics of mosquitoes

Alan McElligott BSc(Cork) PhD(Dublin)
Lecturer in Organismal and Environmental Biology
Behavioural ecology, sexual selection, vocal communication and wildlife management

Alex Mesoudi BSc(Lond) MSc(Liverpool) PhD(St Andrews)
Lecturer in Social, Evolutionary and Cultural Psychology
Human cultural transmission and human cultural evolution

Fanis Missirlis BSc(Patras) PhD(Guelph)
Lecturer in Cell biology
Genetics, cell biology and physiology of iron metabolism

Conrad Mullineaux BA PhD(Leeds)
Professor of Microbiology
Photosynthesis and membrane dynamics in bacteria

Richard Nichols BSc(Lond) PhD(UEA)
Professor of Evolutionary Genetics
Using genetic evidence to understand the biology and history of living organisms

Jonathan Nield BSc PhD(Lond) DIC ARCS
Royal Society Research Fellow, Structural Biology
Transmission electron microscopy; image-processing technique of single particle analysis

Roger Nix MA PhD(Cantab) CChem MRSC
Senior Lecturer in Physical Chemistry
Surface chemistry, heterogeneous catalysis, nanotechnology

Magda Osman BSc(Sussex) PhD(Lon)
Lecturer in Experimental Cognitive Psychology
Mechanisms involved in learning, decision making, and problem solving in complex dynamic environments

Ian Phillips BSc(Rand) PhD(Lond)
Professor of Molecular Biology
Molecular biology and genetics of foreign compound metabolism

Richard Pickersgill BSc(Lond) DPhil(Oxon)
Professor of Structural Biology
X-ray crystallography studies of enzyme structure and function

Research areas

Michael Proulx BSc(Arizona State) MA PhD(Johns Hopkins)
Lecturer in Cognitive Psychology
Cognitive psychology with a focus on attention and perception

Qazi Rahman BSc(Staffs) PhD(Lond)
Lecturer in Cognitive Biology
Cognitive Biology; psychobiology of human sexual orientation

Marina Resmini Laurea PhD(Milan)
Reader in Organic Chemistry
Molecular recognition and enzyme mimics

Steve Rossiter BSc(Sus) PhD(Bris)
Senior Lecturer, Royal Society University Research Fellow
Molecular ecology and evolution of mammals; main focus – bats

Alexander Ruban BSc MSc(Kiev) PhD(Minsk)
Professor in Biophysics
Molecular mechanisms of light energy utilisation and management in the photosynthetic membrane

Jenny Schmid-Araya BSc MSc PhD(Lond)
Senior Lecturer in Freshwater Ecology
Invertebrate body size spectra and food web dynamics, scaling relationships in aquatic systems, surface-subsurface patterns

Peter Skorupski BSc(St Andrews) PhD(Bris)
Lecturer in Neurobiology
Neurobiology of colour vision

Ralf Stanewsky PhD(Cologne) Privat Dozent(Regensburg)
Professor of Neurobiology
Genetic and neuronal control of circadian rhythms in the fruitfly *Drosophila melanogaster*

Angelika Stollewerk PhD(Cologne)
Reader in Evolutionary Developmental Biology
Evolution and development of the arthropod nervous system

Alice Sullivan BA PhD(Trinity Dub) CChem MRSC, Professor of Inorganic Chemistry
Functional solid reagents and catalysts, porous organosilicon materials, phosphonate coordination chemistry

James Sullivan BSc(Leic) PhD(Cantab)
Lecturer in Biochemistry
Protein sorting and degradation

Mark Trimmer BSc(Lond) PhD(Essex)
Reader in Biogeochemistry
Nitrogen transformations in estuarine and coastal sediments

John Viles BSc MSc(Bris) PhD(Lond)
Senior Lecturer in Biochemistry
Role of metals in prion protein structure and function

Tony Vlcek RNDr(Prague) CSc(Czech Academy of Sciences) CChem FRSC
Professor of Inorganic Chemistry
Physical-inorganic chemistry; special emphasis on characterisation of excited states and their ultrafast dynamics

Mike Watkinson BSc(St Andrews) PhD(UMIST) CChem MRSC
Professor of Synthetic Chemistry
Custom design and synthesis of novel functional ligand systems

Shane Wilkinson BSc PhD(Wales)
Senior Lecturer in Microbiology/Parasitology
Molecular parasitology; anti-parasitic chemotherapy

Guy Woodward BSc(Cardiff) PhD(Lond)
Senior Lecturer in Fish Biology and Freshwater Ecology
Freshwater food webs; biodiversity and ecosystem functioning; evolutionary and organismal biology

Peter Wyatt MA DPhil(Oxon) CSci CChem MRSC
Senior Lecturer in Organic Chemistry
Organic synthesis; chemical synthesis of natural product analogues and of optoelectronic materials

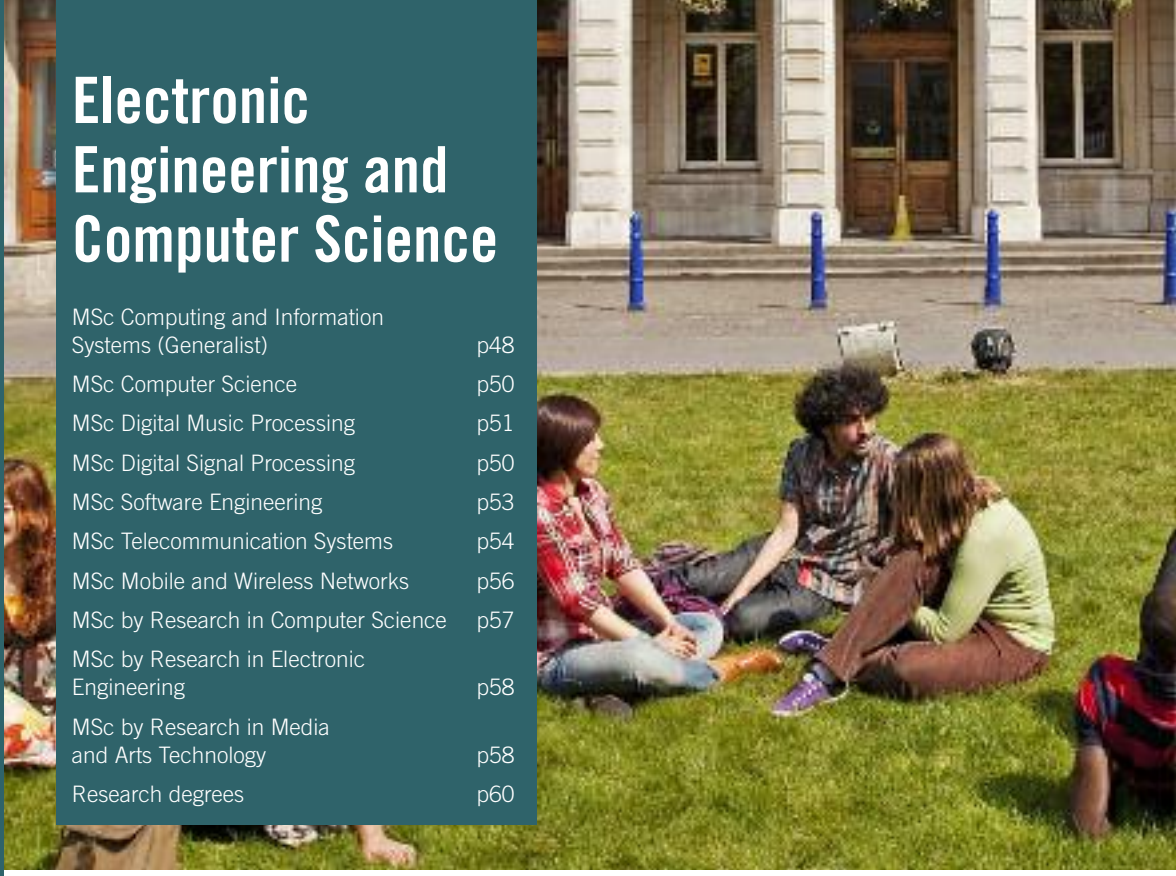
Ali Zarbakhsh BSc(Leeds) MSc PhD(Sheff) MIOP
Lecturer in Physical Chemistry
Structural studies of biological and polymeric systems at buried fluid-fluid interfaces

Bema Khanan, MSc in Chemical Research

"The MSc programme is very well structured, offering a balance of exam assessed and coursework assessed components. The lecturers at Queen Mary are great! They are all very supportive, enthusiastic and approachable. There's also a wide mix of students providing an opportunity to learn about other cultures and interests.

"My current project on drug delivery is the most interesting part of my course so far. I am at a stage where I'm analysing data I've gathered from using various techniques available such as nuclear magnetic resonance spectroscopy and ultra violet spectroscopy. With the help of my supervisor, I'm hoping to make some interesting discoveries to write about in my project."

Electronic Engineering and Computer Science



The School of Electronic Engineering and Computer Science is one of the top 20 universities in the UK for studying computer science and electronic engineering, with outstanding resources, such as our state-of-the-art listening room and laboratories in antennas and augmented human interaction. We have more than 130 members of academic and research staff and a community of more than 2,500 students. We are internationally recognised for our pioneering and ground-breaking research, award-winning teaching, and innovative public engagement programme.

Research strengths

Research in the School of Electronic Engineering and Computer Science is at the cutting-edge; we work on core developments and novel technologies making meaningful and long-lasting contributions that apply to real-world problems. Our research is focused in key areas led by internationally leading researchers. We engage with industry partners and academic colleagues around the world in a variety of sectors and disciplines.

Our research has left indelible marks in areas as diverse as: the foundations of programming languages, digital signal processing, parallel computing, augmented human interaction, and intelligent systems. The benefit of studying for an MSc in a research active School is that you are taught by research leaders.

Postgraduate resources

The School of Electronic Engineering and Computer Science offers taught postgraduate students their own computing laboratory. MSc students have exclusive use of the top floor in our purpose-built, award-winning Informatics Teaching Laboratory (ITL) outside of scheduled laboratory sessions. The ITL boasts state-of-the-art computer systems providing over 250 fully networked multimedia workstations, a robotics research lab, and workshops. The ITL also has an extensive wireless LAN network so that students can use their own laptops.

For postgraduate students on taught and research degrees there are specialist laboratories to use for carrying out research. Our Augmented Human Interaction (AHI) Laboratory combines pioneering technologies including full-body and multi-person motion capture, virtual and augmented reality systems and advanced aural and visual display technologies. We also have specialist laboratories in multimedia, digital signal processing – including a sound laboratory, and microwave antennas.

In addition to these spaces, PhD students have generous study space in our research laboratories. In early 2011 we completed the development of new experimental facilities in antennas (£1m) and digital music (£0.5m).

We formed the Interdisciplinary Informatics Hub in Collaboration with the Schools of Biological and Chemical Science and Mathematical Science. These laboratories and associated office spaces house around 40 researchers, providing a meeting place for postgraduates from all departments to interact and exchange ideas.

Scholarships/studentships

MSc scholarships

The College provides Computer Science and Electronic Engineering studentships worth £2,000 to a limited number of high-quality applicants.

These awards can be held in conjunction with other funding and are awarded on the basis of exceptional academic merit, on a first come

Research quality indicators

The Research Assessment Exercise
Significant investment in research expertise led to excellent results in the 2008 Research Assessment Exercise (RAE 2008), confirming that we offer internationally leading research. We submitted 80 per cent of academic staff in Computer Science to RAE 2008 and 75 per cent of these academic staff and their research output was deemed to be three or four star (four being the highest possible number of stars). We submitted 90 per cent of our Electronic Engineering academic staff, of which 50 per cent were rated at either three or four star.

Projects, funding, research grants and awards
Our current active grant portfolio is £34 million, with many prestigious EPSRC Platform and Programme Grants. Professor O'Hearn and members of the Computer Science Theory group received EPSRC Platform and Programme Grants valued at £3.2m. Dr Curzon and members of the Interaction, Media and Communication group, along with colleagues at University College London, have been awarded an EPSRC Programme Grant valued at £5.8m to study human error and medical devices. Professor Parini and the Antennas and Electromagnetics group have been awarded more than £1m to research the use of microwave systems for healthcare and imaging. Professor Sandler and members of the Centre for Digital Music and the Interaction, Media and Communication group have been awarded more than £5m to establish a doctoral training centre in Media and Arts Technology. The programme provides ten four-year PhD scholarships per year for five years.

first served basis at the time of application to one of our programmes.

For further information, please see www.qmul.ac.uk/postgraduate/studentships for further information.

A small number of Westfield Trust Bursaries (worth £2,000) are available to students on our MSc programmes. All applicants will be automatically considered for these awards and there is no separate application form. Successful candidates will be informed before the end of May.

UK Government scholarships
The British Council administers the UK Government's Chevening Scholarship programme. This is a special worldwide scheme to fund masters level study by international students and Queen Mary attracts about 20 Chevening scholarship winners every year.

For further information please contact either www.chevening.com or your local British Council office www.britishcouncil.org who will also be able to inform you of any other scholarship opportunities open to you.

For further information regarding these scholarships please visit www.qmul.ac.uk /international/scholarships or contact our Postgraduate Administrator.

PhD scholarships
The School has a number of EPSRC, College, industrial and internationally funded research studentships available for PhD students beginning in the autumn of each year. These are available to UK, EU and international students and pay for tuition fees and/or provide a tax-free maintenance grant. There is always strong competition for these and interested students should apply as early as possible, preferably between January and March. There is no separate scholarship application form; however, please ensure you indicate on the postgraduate application form that you wish to be considered for a scholarship.
For further information regarding our scholarships

please visit www.eecs.qmul.ac.uk/ phd or contact our Research Students Coordinator.

Further information

Postgraduate Administrator
Rupal Vaja
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

Research Students Coordinator
Melissa Yeo
Tel: +44 (0)20 7882 5357
email: phd-enquiries@eecs.qmul.ac.uk

Director of Postgraduate Studies (teaching)
Dr Tony Stockman
Tel: +44 (0)20 7882 5202
email: tonys@eecs.qmul.ac.uk

Director of Postgraduate Studies (research)
Professor Xiaodong Chen
Tel: +44 (0)20 7882 7983
email: xiaodong.chen@eecs.qmul.ac.uk

General postgraduate information
Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teama@qmul.ac.uk

Careers

We are committed to being leaders in research, and training future leaders. The world of electronics, communications, media technologies and computing offers challenging, creative, and well-paid careers in a variety of economic sectors. There is currently a shortage of highly qualified graduates in both computer science and electronic engineering related fields, making exciting career opportunities and excellent salaries the norm.

Your future plans may involve working on the research and development of new technologies and applications – either in the laboratories of a large manufacturer or in a smaller contract research and development company where there would be opportunities to work with a variety of clients. For this type of work, career progression is through project leadership into positions of increasing technical challenge and responsibility. Alternatively, you may prefer to work on large projects which require organisational skills and leadership. Initially this might involve working at a junior level in support of major projects, but with increased experience the career path opens into senior project and company management.

PhD graduates have even more career opportunities. Vodafone, Microsoft Research, IBM, Hewlett Packard and Philips are just a few of the major companies employing our graduates in research capacities. Recent PhD graduates who are pursuing careers in higher education have found postdoctoral positions at New York University, Stanford University, University of Amsterdam, Queen Mary, University of London and University of Sussex.

Degree programmes

MSc Computing and Information Systems (generalist)

One year full-time, two years part-time, two years part-time by distance learning

Programme description

This MSc is an intensive one-year generalist programme for highly motivated graduates with a good honours degree, but with little prior experience of computer science. You will develop theoretical and practical skills in computing and information systems development. The core modules introduce aspects of computing, including a double module in object oriented programming (using Java) and a double module in information systems.

These core modules are supplemented by optional specialist modules covering a broad range of subjects relevant to the software industry, such as Internet Computing, Business Information Systems and Decision and Risk. Your project work will typically involve the design and implementation of a significant piece of software within your chosen specialism. Projects undertaken for external organisations are encouraged.

Programme outline

Core modules: Database Systems • Java Programming (double module) • Software Engineering (double module) • Systems Analysis • MSc Project

Module options include: Network Programming • Business Information Systems • Computational Genomics • Entrepreneurship in Information Technology • Graphical User Interface Design • Interaction Design • Software Risk Assessment

Please note that module availability is subject to change.

Assessment
All modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent. In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
A first degree in a subject not related to computer science, or a degree with less than 50 per cent of the modules in computer science subjects. We require a minimum of an upper second class honours degree, and we normally look for a Grade Point Average (GPA) of greater than 3.2. We also need evidence of mathematical ability equivalent to UK GCSE grade B, and that you have completed an individual project as proof of your ability to study independently. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Accenture (EC4M), British Telecommunications Plc, Camelspace, Datang Microelectronics Technology Co Ltd, Hellagro Ltd, Kaplan Financial, KPMG, Lancaster University, Melli Bank Place, Pacific World Ltd (Thailand), Queen Mary, University of London

Further information
Please contact: Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

Graduate profile: Samuel Pachoud

Studied: PhD Computer Science

Currently: Management Consultant at Ernst & Young

Why did you choose Queen Mary?
In 2005, I visited for 6 months the Multimedia and Vision group at Queen Mary, University of London (QMUL), working as a guest research student in the area of clustering and behaviours analysis.

At the end of the project, my supervisor at QMUL offered me a joint PhD position. The quality of the facilities, the location of the campus (zone 2, on the Central and District lines, close to the City Centre) and the various friendships I created at QM convinced me to pursue PhD study at QM. Thus from September 2006 to July 2010, I was a PhD student at the Computer Science department.

What did you gain from your time at Queen Mary?
Great time and numerous friends, both within my fellow PhD students and members of staff. I also gained a lot of transferable skills, thanks to the different responsibilities and extracurricular activities that QM provides to its staff/students.

What are your career plans for the next five years?
Starting a new career in the business world after enjoying several years in academia gives me plenty to think about in the next five years. More specifically I target to be at a managerial level where I will have the opportunity to supervise people and take on more responsibilities.

Degree programmes

MSc Computer Science

One year full-time, two years part-time

Programme description

This MSc programme offers a broad range of advanced study options, with modules taken from a variety of application areas. It is multi-disciplinary and, in addition to computer science, you may choose options in which computer science intersects with other fields. The programme prepares you for a wide range of careers depending on your selection of modules studied. Typical jobs after graduation include advanced programmer, software development and support, software engineer, product designer/developer, systems analyst, interface/interaction designer, database developer, and other specialist employment based on your selected study areas.

Programme outline

Core modules: Research Methods (double module) • MSc Project

Module options include: Advanced Database Systems and Technologies • Advanced Program Design (in Java) • Algorithms and Complexity • C++ for Image Processing • Computability • Computational Genomics • Computer Vision and Neural Networks • Design for Human Interaction • Distributed Systems and Security • Entrepreneurship in Information Technology • Foundations for Information Retrieval • High Performance Computing • Interactive Systems Design • Multimedia Systems • Software Risk Assessment • Special Topics in Information Retrieval • Specification and Verification • Techniques in Computer Vision • The Semantic Web • XML and Structured Information

Please note that module availability is subject to change.

Assessment

The Research Methods modules are assessed through coursework alone. All other modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent.

In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements

You should possess a good honours degree (minimum upper second class) with a substantial computer science component (at least half) or equivalent industrial experience. You should also have good programming skills for undertaking the practical elements of the programme.

For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the ‘International students’ section on page 144.

Recent graduate destinations

Support Engineer, Computer Assets; Analyst, Credit Suisse First Boston; Business Analyst, Norton Rose; Queen Mary, University of London; Tesco Plc; The Open University

Further information

Please contact:
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc Digital Music Processing

One year full-time, two years part-time (Subject to approval)

Programme description

This masters is based on our Digital Signal Processing (DSP) programme, and incorporates additional specialist modules and a specialised project. You will graduate with an understanding of how today's audio and music technology works, with the potential to become a leader in developing future generations of these technologies.

This programme prepares you for a range of careers related to the music industry, the recording industry and the creative arts, including those in technical development. It also opens up the possibility of progressing to further study.

Programme outline

Core modules: Fundamentals of DSP (1) • Advanced Transform Methods • Music Analysis and Synthesis • Music and Speech Processing • Digital Audio Effects (1)

Module options: Real Time Digital Signal Processing • Digital Broadcasting • Design for Human Interaction • Multimedia Systems • Machine Learning

(1) = This module is taken in the first year of part-time by distance learning study.

Please note module availability is subject to change.

Assessment

All modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent.

In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written

Giuseppe Passino, PhD Computer Science

"I am studying computer vision, that is, how computers can analyse and extract information from images and videos, to interact with the surrounding environment.

"The course allows me to pursue my interests, maximising my learning and research on topics that I find fascinating. The College is helpful in many ways, offering plenty of opportunities to share ideas, to listen to interesting talks, and to apply for workshops, projects and other initiatives.

"My experience within the Multimedia and Vision research group in the School of Electronic Engineering and Computer Science has always been rewarding. For a PhD student it is very helpful to count on an internationally regarded group with a good reputation in the field. I got in touch with great experts in the field, and attended many interesting conferences as well as two fruitful summer schools."

Christopher Sutton, MSc in Digital Music Processing

"I chose Queen Mary mainly because the Digital Music Processing course so closely matched what I wanted to do and the Department is very highly regarded in the Digital Music field.

"I'm studying Digital Music Processing which combines the more traditional Digital Signal Processing with music-specific elements. It's a combination only tackled by a few masters programmes in the UK and the Queen Mary programme is particularly well designed.

"The programme is great because the lecturers are experienced and enthusiastic about their subjects and the Department is particularly friendly to students.

"I have been consistently impressed by the teaching standards and the attitudes of staff towards masters students. The Department is certainly innovative, with the Centre for Digital Music rapidly expanding and making its mark on the research field."

Degree programmes

examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
You should have a first or upper second class degree in electronic engineering, computer science, mathematics, or a related discipline. Applicants with unrelated degrees will be considered if there is evidence of significant industrial experience. Applicants with lower second class degrees may be considered if the undergraduate degree specialised in relevant subjects. Applicants should also have completed an undergraduate programme in at least one of the following areas: signal processing, control, or analogue filters. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Creative labs, FXpansion, Sonnox, Sonalksis, Intrasonics, EMI, Calrec Audio, Rockstar Games

Further information
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc Digital Signal Processing

One year full-time, two years part-time (Subject to approval)

Programme description
This programme is specifically intended to respond to a growing skills shortage in industry for engineers with a high level of training in signal processing, and to support internet, multimedia, broadcast, communications, and consumer industries.

You will develop core knowledge of basic DSP theory and its implementation in hardware. In addition you will be able to specialise in areas including multimedia and intelligent signal

processing. The taught modules are fully supported, with computing and laboratory work. The MSc is intended for graduates in a related discipline, who wish to enhance and specialise their skills in the area, and also for industrialists with some experience of working with signal processing in the IT sector, who wish to obtain a formal qualification.

Programme outline
Core modules: Fundamentals of DSP (1) • Advanced Transform Methods • Multimedia Systems • Music and Speech Processing • Image and Video Processing • Machine Learning

Module options: Real Time Digital Signal Processing • Digital Broadcasting • C++ For Image Processing

(1) = This module is taken in the first year of part-time by distance learning study.

Please note module availability is subject to change.

Assessment
All modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent. In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
You should have a first or upper second class degree in electronic engineering, computer science, mathematics, or a related discipline. You should have programming experience from your undergraduate degree. Applicants with unrelated degrees will be considered if there is evidence of significant industrial experience. Applicants with lower second class degrees may be considered if the undergraduate degree specialised in relevant subjects. Applicants should also have completed an undergraduate programme in at least one of the following areas: signal processing, control, or analogue filters. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Sound Engineering, Digital Sound Engineering Company; Signal Design Engineer, Metronet Rail Ltd; Engineer, Sony Ericsson; Engineer, Streaming Networks

Further information
Rupal Vaja
Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc Software Engineering

One year full-time, two years part-time

Programme description
This MSc programme focuses on advanced theoretical and practical techniques in program design, and the management of software project risk. It includes training in vital areas such as security, specification, risk management, usability, and design integrity.

You will learn advanced techniques in program design (including software patterns and component technologies) and information handling (structured information, databases). You can study key issues of interactive system design, leading to the ability to identify issues and trade-offs in the design of human-computer interaction, and to invent and evaluate alternative solutions to design problems. You will gain knowledge in the mathematical foundations of software and the practical application of these techniques. You will develop skills to manage software project risks and learn about the development of tools to support decision-making.

Degree programmes

The programme will enable you to become competitive in the most technically oriented branches of software engineering. Typical jobs after graduation include software risk analyst, system designer, software quality assurance, software engineer, programmer, usability consultant, systems analyst, and software architect.

Programme outline
Core modules: Advanced Program Design (in Java) • Research Methods (double module) • MSc Project and at least one of: Software Risk Assessment • Specification and Verification

Module options include: Advanced Database Systems and Technologies • Algorithms and Complexity • Distributed Systems and Security • Entrepreneurship in Information Technology • Interactive Systems Design • Foundations for Information Retrieval • The Semantic Web • XML and Structured Information

Please note that module availability is subject to change.

Assessment
The Research Methods modules are assessed through coursework alone. All other modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent. In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
You should possess a good honours degree (minimum upper second class) with a substantial computer science component (at least half) or equivalent industrial experience. You should also have good programming skills for undertaking the practical elements of the programme.

For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Oracle, Thale, University of York

Further information
Rupal Vaja
Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc Telecommunication Systems

One year full-time, two years part-time by distance learning

Programme description
This programme provides training in the principles and applications of telecommunications through an integrated curriculum designed to respond to rapid developments and growing demands. It emphasises both the underlying technologies and the techniques required for their analysis and understanding. You will understand how different infrastructures and designs affect commercial decisions.

Programme outline
Core modules: Introduction to Networks • Communication Systems • Twenty-first Century Networks • Network Modelling and Performance • Network Planning Finance and Management • Research Methods • MSc Project

Module options include: Security and Authentication • Ad Hoc and Broadband Wireless • Business Technology Strategy • Ubiquitous Computing • Intelligent Agents and Multiagent Systems • Internet Computing

Please note that module availability is subject to change.

Assessment
All modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent. In addition to the above, the MSc requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
You should have a first or upper second class degree in electronic engineering, computer science, mathematics, or a related discipline. You should have programming experience from your undergraduate degree. Applicants with unrelated degrees will be considered if there is evidence of equivalent industrial experience. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Chief Technical Officer, Business Object Solutions Ltd; Analyst, Global Insight; Vice President, Habib Bank Ltd; Manager, Lucent Technologies

Further information
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

David Turner, MSc in Telecommunications

"I chose Queen Mary because of its excellent reputation academically and because the course I was interested in targeted the key skills currently demanded of specialists in the software engineering sector.

"Moreover, I found the delivery of the course through virtual lectures and tutorials, together with electronic message boards well suited to my needs as a distance-learning student.

"The academic staff are very strong in their field and excited by the technology. This is evident in their delivery of the course, which is well-researched and clearly communicated. The support staff are also first class and are always quick to respond to any queries distance-learning students may have.

"I would rate Queen Mary very highly in terms of teaching. It is internationally recognised as a leading teaching and research institute and this is certainly reflected in the standard of teaching I have experienced during my time at Queen Mary. One of the coursework assignments focused on wireless security. This is an area that I am particularly interested in and is particularly topical in the e-Commerce sector at the moment. Those distance learning students that I have spoken to either during exam week or through the electronic message boards strike me as being very focused and professional individuals who are clearly dedicated to their studies."

Graduate profile: Keisuke Toyama

Studied: MSc by Research in Electronic Engineering (with distinction)

Currently: Currently I am a senior researcher at Sony, and have been involved in several R&D projects as a leader.

Why did you choose Queen Mary?
I was fortunate enough to win a one year study abroad scholarship from Sony. This MSc programme offered an excellent opportunity for me to gain in-depth knowledge blind source separation – a technique to separate individual sounds automatically. I knew that the Centre for Digital Music was one of the world's leading research centres, and Professor Mark Plumbley is one of the most renowned researchers in the field. Also, Queen Mary offered the MSc by Research programme. Although it is one-year taught programme, I could take the MSc degree mainly by doing research like PhD students. All the above reasons meant that Queen Mary was the best choice for me.

What did you gain from your time at Queen Mary?
An excellent study environment. I successfully submitted my research paper to four international conferences and workshops. I also got the 'best student paper' prize at the ICA research network international workshop.

What are your career plans in the next five years?
I will continue to work for Sony – hopefully as a research engineer or manager in the near future. If I had the chance, I would like to continue my studies with a PhD degree.

Degree programmes

MSc Mobile and Wireless Networks

One year full-time, two years part-time by distance learning

Programme description

This programme is aimed at graduates who wish to develop careers in the wireless telecommunications sector, especially those concerned with the radio aspects. It covers topics ranging across all layers in the wireless and mobile networking fields, but with particular emphasis on the physical layer of wireless cellular telephony, ad-hoc networks and wireless LANs. You will also study antenna design for mobile networks and electromagnetics aspects. At the end of the programme you will be equipped with the skills needed for a wide range of jobs in the expanding telecommunications industry, with particular emphasis on those that are relevant to the needs of wireless equipment manufacturers and operators.

Programme outline

Core modules: Introduction to Networks • Communication Systems • Wireless Networks • Ad Hoc and Broadband Wireless • Research Methods • MSc Project

Module options include: Antennas for Mobile Applications • Radio Wave Propagation • Satellite Communications • CAD Techniques for RF Electromagnetics • Business Technology Strategy • Ubiquitous Computing • Intelligent Agents and Multiagent Systems

Please note that module availability is subject to change.

Assessment

All modules are examined through a combination of coursework and written examinations taken in May/June. To obtain an MSc, students must gain passes in six of the eight modules taken with an overall average of 50 per cent. In addition to the above, the MSc

requires that a satisfactory individual project be completed. MSc students who do not pass the written examinations are only allowed to attempt the project after passing resit examinations the following May.

Entry requirements
You should have a first or upper second class degree in electronic engineering, computer science, mathematics, or a related discipline. Applicants with unrelated degrees will be considered if there is evidence of equivalent industrial experience. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Recent graduate destinations
Airwide Solutions; King's College London; Motorola (China) Technologies Ltd; Schlumberger; Wateen Telecom

Further information
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc by Research in Computer Science

One year full-time, two years part-time

Our MSc in Computer Science by Research involves an extended (one-year) individual research project carried out as part of one of our established research groups, combined with selected taught modules.

This programme offers you the chance to undertake an advanced masters programme through an extended research project. The programme is suitable for outstanding students who have an interest in advanced research-based study in one of our research specialisms: Computer Vision; Interaction, Media and Communication; Risk Information Management; Computer Science Theory.

The MSc by Research programme will give you solid theoretical and practical research competence in your chosen field of study and will enhance your employability. Successful completion of the programme may also provide a route to further study at doctoral level or for a research and development position in industry.

Programme outline
You will join one of our research groups, taking four selected taught modules and completing an extended research project. You will have the opportunity to develop further research and technical skills and to be able to demonstrate a level of independence that is greater than developed on a purely taught programme.

Assessment
All students are required to take written examinations in May/June. The MSc requires that a satisfactory research project should be completed. A mark of 50 per cent or more must be attained in all components.

Entry requirements
You should possess a good honours degree (minimum upper second class) in a relevant subject. In your application you should identify the relevant research group. Offers are subject to the agreement of a suitable research proposal. For international students we require English language qualifications IELTS 6.5, TOEFL (CBT) 237 or TOEFL (written test) 575. Please see the 'International students' section on page 144.

Further information
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

Degree programmes

MSc by Research in Electronic Engineering

One year full-time

Programme description
An MSc by Research will provide you with the necessary skills to undertake research, either in an academic or industrial environment. The expectation is that every graduate from the degree publishes at least one conference paper as part of their research. You will have the opportunity to develop further research and technical skills and to be able to demonstrate a level of independence that is greater than developed on a purely taught programme.

The programme is suitable for outstanding students who have an interest in advanced research-based study in one of our research specialisms: Antennas and Electromagnetics; Centre for Digital Music (C4DM); Multimedia and Vision (MMV); Networks.

Programme outline
You will join one of our research groups, taking four selected taught modules and completing an extended research project. You will have the opportunity to develop further research and technical skills and to be able to demonstrate a level of independence that is greater than developed on a purely taught programme.

Assessment
All students are required to take written examinations in May/June. The MSc requires that a satisfactory research project should be completed. A mark of 50 per cent or more must be attained in all components.

Further information
Rupal Vaja, Postgraduate Administrator
Tel: +44 (0)20 7882 7335
email: msc-enquiries@eecs.qmul.ac.uk

MSc by Research in Media and Arts Technology

One year full-time

This new programme aims to produce postgraduates with excellent technical and creative skills, who have a unique vision of how digital technology transforms creative, technical and social possibilities. You will receive training in the full research cycle including identifying a problem, choosing suitable methods to address it (eg qualitative, experimental, practice-based) and communication of results.

You will develop a critical appreciation of the technical and creative state-of-the art in contemporary applications of digital media. In addition you will learn key technical skills that will enable you to produce new applications of your own. You will then apply this learning to a six-month advanced placement project with one of our partner organisations leading to a thesis (see www.mat.qmul.ac.uk for a full list of our partners).

Programme outline
Semester one
Core modules: Advanced Research Methods • Interactive Digital Multimedia Techniques (including processing/Max MSP/Jitter / Arduino) • Contemporary Studio Production Techniques (video production, audio production)

Plus one optional module selected from: Digital Broadcasting • Java Programming • Design for Human Interaction • Multimedia Systems • Image and Video Processing • C++ for Image Processing • XML and Structured Information • Distributed Systems and Security • Performance Research (subject to availability)

Semester two
Core modules: Group Project and Advanced Placement Project

Assessment
The core modules are assessed through coursework alone. Optional modules are examined through a combination of coursework and written examinations taken in May/June. To obtain the MSc, students must gain passes in all modules taken with an overall average of 50 per cent including the advanced placement project, which is examined by thesis and viva.

Entry requirements
We seek outstanding applications from students with proven technical and creative abilities who wish to develop their skills and take advantage of the unique opportunities offered by the Media and Arts Technology Programme. You will need to have a minimum of an upper-second class degree or equivalent in any science, engineering or design oriented discipline and evidence of programming or mathematical ability.

Further information
Richard Kelly
MAT Programme Manager
Tel: +44 (0)20 7882 7335
email: mat-enquiries@eecs.qmul.ac.uk

Mary Lavelle, PhD in social interaction in schizophrenia

"I am part of the Interaction, Media and Communication group. As a research group we are very diverse, integrating people from a variety of disciplines.

"The group meet regularly and discuss our work or relevant readings. It's really helpful to be part of a multidisciplinary team because everyone brings different kinds of knowledge and skills.

"One of the best things I've done so far is train to use the motion capture equipment in the Augmented Human Interaction Lab. The postgraduate development and study skills courses provided by the Learning Institute at Queen Mary, University of London are also very helpful. They've allowed me to broaden my skills in a variety of areas while completing my PhD."

Research

We are well-known for our pioneering research and pride ourselves on our world-class research projects. Joining us as a PhD student gives you the chance to experience this buzz and be part of our efforts to shape the future of electronic engineering and computer science.

We have a dynamic community of approximately 150 PhD students and 80 research assistants in our labs working on leading-edge research. We offer well-integrated doctoral study programmes in our various areas of specialisation, and each of our research groups is involved in internationally leading research, funded by UK Research Councils, the European Union, and industry around the world.

As one of the UK's leading Electronic Engineering and Computer Science Schools, we offer our postgraduate students a comprehensive and supportive training environment. You will work as part of a friendly and vibrant research community under the supervision of experts in the field. As a member of one of our research groups you will be accommodated in a research laboratory alongside other PhD students and full-time post-doctoral researchers. Students often participate in the funded research projects of the group. We provide a generous travel budget to enable research students to present papers at international conferences. Budgets for expenditure on experiments, equipment, and software are also available.

For more detailed information and funding opportunities for PhD students, please visit our website: www.eecs.qmul.ac.uk/phd

Further information
Melissa Yeo
Research Students Coordinator
Tel: +44 (0)20 7882 5357
email: phd-enquiries@eecs.qmul.ac.uk

Media and Arts Technology (MAT)
The PhD in Media and Arts Technology is an innovative interdisciplinary training programme in the science and technologies that are transforming the creative sector. Our mission is to produce postgraduates who combine world-class technical and creative skills and who have a unique vision of how digital technology transforms creative, technical and social possibilities.

This is a unique four year PhD programme built around core modules in advanced research methods, interaction design and digital media processing, production and recording techniques. There are also optional specialist modules ranging from Digital Audio Effects through Digital Rights Management to Contemporary Performance. You will work under the supervision of internationally recognised experts in: • Digital Music • Digital Video • Human Interaction • Performance and Live Art

You will also develop a working partnership with one of our strategic collaborators including: BBC, The British Film Institute, last.fm, and BT. Our programme is part of a £250m strategic initiative, funded by Research Councils UK, and is exceptionally well resourced. You will have access to our state-of-the art research and performance facilities including the Augmented Human Interaction Laboratory and the Pinter Studio Theatre as well as the extensive resources offered by our industrial and public sector partners.

New in 2011 were the Media and Arts Studios including the Listening Room, Control Room and Performance Laboratory as well as the full range of resources offered by the School of Electronic Engineering and Computer Science. For more detailed information and funding opportunities please see: www.mat.qmul.ac.uk

Further information
Richard Kelly
MAT Programme Manager
Tel: +44 (0)20 7882 7335
email: mat-enquiries@eecs.qmul.ac.uk

Research areas

Our main areas of research are defined as follows. For more detailed information please visit each research group's web pages: www.eecs.qmul.ac.uk/research

Antennas and Electromagnetics

Established in 1968 the group has comprehensive experimental facilities housed in the Antenna Measurement Laboratory, which has recently received £1m in infrastructure investment. The group has strong links with industry and a current active grant portfolio of over £4m, which includes a prestigious EPSRC platform grant valued at £1.2m to fund post-doctoral researchers as well as in-reach and outreach activities with other world-leading antenna laboratories.

Our research on antennas for mobile communications includes multiband antennas, multiple antennas for MIMO applications, Ultra wideband (UWB) antennas, semi-smart base station antennas and antennas and radio propagation for body centric communications. In the area of metamaterials we study computational electromagnetic models for both active and passive structures. We study new nano-materials such as graphene and carbon nanotubes that offer possible advances in antennas and metamaterials. We develop software techniques to exploit the concepts of Transformation Electromagnetics, offering such novel devices as flat multi-reflector antennas and cloaking devices.

Our research on Terahertz Spectroscopy aims to help scientists visualize structures such as proteins and actively enhance chemical reactions. In the area of antennas and healthcare we study the interaction of electromagnetic waves with biological tissue, dosimetry, wireless implants and RF sensors for example in blood glucose monitoring. We also apply CEM to Microwave Electron Tube Devices to understand design of magnetrons with the aim of developing compact high power millimetrewave sources. In the area of metrology we work on near-field measurement, millimetrewave imaging for security and compact antenna test range development.

Staff research interests

Akram Alomainy MEng PhD(Lond)
Lecturer
On-body radio propagation, wearable antennas, compact medical monitoring sensors, computational electromagnetic, intelligent networking for low-power and efficient body area networks

Professor Xiaodong Chen PhD SMIEEE MIET(UESTC, CHINA)
Professor
Microwave devices, antennas, wireless communications and bio-electromagnetics

Rob Donnan PhD MInstP MIET(W'gong, Australia)
Lecturer
Metrology of quasi-optical systems, Dielectrometry, THz spectrometry for bio-chemical science

Professor Yang Hao PhD(Bris)
Professor of Electromagetics
Antennas and propagation for body-centric wireless communications, microwave metamaterials and their applications, computational electromagnetics, millimeterwave, THz and photonic antennas

Professor Clive Parini BSc PhD FIET MIEEE CEng(Lond)
Professor of Antenna Engineering
Microwave, millimetrewave and Terahertz antenna theory, design and measurement, antennas for mobile communications, Metamaterials, Bioelectromagnetic, Ultra wide-band antennas

Centre for Digital Music

The Centre for Digital Music (C4DM) is a world-leading multidisciplinary research group in the field of music and audio technology. In less than a decade, the Centre has grown to become the UK's leading Digital Music research group. We hold several substantial EPSRC Grants, including a platform grant, and a Doctoral Training Centre. Resources include our state-of-the-art Listening Room and Performance Lab as part of the new Media and Arts Technology Studios.

Our projects span many different disciplines, including digital signal processing (DSP), semantic web (www.musicontology.com), knowledge processing, live performance, musicology, software engineering, and interaction. We emphasise adventurous and trans-disciplinary research, pushing the boundaries of DSP, computer science, philosophy and psychology. We investigate topics such as music information retrieval (MIR), music scene analysis, semantic audio processing, object-based audio coding, machine listening, human machine interaction and digital performance.

Much of our research targets real users, seeking to build new algorithms into usable and useful software. We have developed systems for automatic play-listing from personal collections (www.isophonics.net/SoundBite), for looking inside the audio (www.sonicvisualiser.org) for automatically synchronising to a drummer (B-Keeper) and for collaborative composition (DaisyPhone for iPhone), and many others. We regularly release algorithms under open source licenses. See our interactive art installations at www.c4dmpresents.org

Staff profile: Dr Akram Alomainy

Lecturer, Electronic Engineering

"My interest in antennas and electromagnetics started form the first year of my degree programme (MEng Communication Engineering, Queen Mary), when I took the module Electric and Magnetic Fields. From that point on I wanted to find out more about antennas and how can they make our lives more connected and efficient. This led to my research in body-centric wireless networks. Ultimately I want to create a more reliable and efficient means of communication.

"I joined the School of Electronic Engineering and Computer Science in 2007 and have authored and co-authored three book chapters and over 57 technical papers in leading journals and peer-reviewed conferences. My current research grants portfolio includes three research council and industry supported projects as principle investigator and two projects supported by EPSRC as a co-investigator. I am also a reviewer for high impact IEEE journals, IET proceedings and international conferences in the area of antennas, radio propagation and wireless communications.

"I always ensure that my teaching includes a substantial element of my own research; in particular how it is connected with 'real world' concerns.

"Queen Mary has a vibrant postgraduate community with excellent teaching, research and laboratory facilities. Various workshops are organised to formalise the soft skills acquired by students in the course of their studies."

Research areas

Staff research interests

Nick Bryan-Kinns BSc MSc PhD(Lond)
Senior Lecturer
Mutual engagement and group creativity, especially interactional sound and music, randing from installation art to sonification in the workplace

Simon Dixon AMusA LMusA BSc PhD(Sydney)
Lecturer
Music informatics, semantic audio, music signal processing, transcription, synchronisation, recommendation, representation, rhythm, harmony, expressive performance, metadata, semantic web, computational musicology

Professor Mark Plumbley MA PhD(Cantab)
Professor in Signal Processing
Analysis of audio and music signals, including audio source separation and automatic music transcription and beat and rhythm analysis

Joshua D Reiss BScMath BSc PhD(Georgia Tech, USA)
Senior Lecturer
Application of state-of-the-art signal processing techniques in order to enable improved recording, mixing, mastering and distribution of digital music

Andrew Robertson MA(Oxon) MSc PhD(Lond)
Research Fellow
Real-time analysis of music signals and interactive performance systems

Professor Mark Sandler BSc PhD SMIEEE FAES CEng FIEE(Essex)
Professor of Signal Processing
Digital audio and music, music information retrieval, semantic and intelligent audio

Computer Science Theory

Our Computer Science Theory group specialises in the logical, mathematical and statistical foundations of computer science, with a breadth and depth of expertise almost unmatched in the UK. The group's expertise is broad in range – from complexity, through automated reasoning, concurrent and distributed systems, formal methods in human-computer interaction to verification of systems software and logic. We tackle the hard problems inherent in discovering the power and limitations of computer systems, and how principled design, based on the right mathematical models might make them more robust and secure.

We collaborate with NASA, Intel, Microsoft, and other companies and government agencies on using novel mathematical modelling techniques. Our group is known as a world-leading centre for research on logical methods for reasoning about computer systems. We have spearheaded several developments separation logic, logic for continuous systems, information theory for security, process types for web services in which novel theoretical developments by us have been brought to bear in new application areas. We have also made fundamental contributions in pure logic (model theory, proof theory, categorical semantics), and in complexity theory.

At the moment we have about £8m in research funding, supporting a thriving intellectual community. This includes an EPSRC Platform Grant, awarded to leading research groups in the UK to underpin their strategic development, and two EPSRC Programme Grants (in collaboration with other institutions), which support research challenges of major significance.

Staff research interests

Dino Distefano MSc(Pisa) PhD(Twente)
Research Fellow
Logic, automated software verification, program analysis, model checking, concurrency

Kohei Honda MSc PhD(Keio, Japan)
Reader
Theories of interacting processes for the deeper understanding of general computational behaviours, from assemblers to distributed computation

Matthew Huntbach BSc(Lond) MA DPhil(Sus)
Lecturer
Concurrent programming languages, specifically in languages to describe systems that consist of multiple agents interacting with each other

Pasquale Malacaria Laurea(Rome) DEA PhD(Paris)
Reader
Semantics of programming languages and their application to static analysis, computer and software security

Professor Ursula Martin BA MA(Cantab) MSc PhD(Warw) FBCS FIEE CEng
Professor of Computer Science
Computational logic in mathematics and its applications in pure mathematics, symbol computation, numerical libraries and mathematical modelling

Professor Peter O'Hearn BSc(Dalhousie) MSc PhD(Queen's, Canada)
Professor of Computer Science
Logic and semantics of computation; automatic program analysis; mechanised verification

Paulo Oliva BSc(UFPE, Brazil) MSc PhD(Aarhus University, Denmark)
Research Fellow
Mathematical logic, structural proof theory, higher-type computability, complexity theory, game theory, Hoare logic and formal verification

Soren Riis MSc(Copenhagen) PhD(Oxon)
Reader
Algebraic proof complexity, mathematical logic, bounded arithmetic, complexity theory, non-standard models, network coding and representation theory and algebra

Noam Rinetzky BSc(Tel Aviv) MSc(Technion) PhD(Tel Aviv)
Research Fellow
Semantics, logics, abstraction, analysis, debugging and programming modes for concurrent and heap-manipulating systems

Professor Edmund Robinson MA PhD(Cantab)
Professor of Computer Science
Logic, category theory and the semantics of programming languages and type theories

Computer Vision

Our Computer Vision group is internationally renowned for its work on modeling object behaviour, human facial and body action, facial synthesis and super resolution, multi-modal biometrics, 3D deformable shape, and structure from motion. The work has been widely applied to vehicle and people detection and tracking; behaviour screening and anomaly detection in public space CCTV.

Our core expertise includes statistical machine learning, time series analysis, dynamic Bayesian graph models, multi-view geometry, multi-modal data fusion, neurobiologically inspired vision, and image compression. The group's research attracts significant interest from industry and the government, including a large amount of international funding. Since 1998, the group has had direct industrial funding from the US and Australia for an R&D project developing computer vision-based advanced incident monitoring systems. Since 2007, the group has received venture capital investment; UK and US government seed funding for video analytics commercialisation. This work has also been the primary IPR for two start-up companies in the US, Australia and UK.

Recent projects include SAMURAI, global behaviour inference over distributed multi-camera networks; LIREC, emotion and body language recognition; BEWARE, multi-camera object tracking and abnormal event recognition

Staff profile: Professor Peter McOwan

Professor of Computer Science

"I work on biological and computer vision, face perception and synthesis and mathematical modelling of perception funded by EPSRC and the Royal Society. Expression and gesture recognition for robots, the LIREC project funded by EU and Public understanding of science for example through sodarace.net funded by EPSRC.

"I have long held a fascination with artificial intelligence, human vision and perception and a strong belief in the importance of interdisciplinary research. Ideally my research would lead to a deeper understanding of how the human brain works. This in turn would lead to better computer technologies that can respond to human emotions.

"Student projects often work directly on elements of my main research programme. The interdisciplinary mix of my research interests give students a range of project options, from robots vision systems to mood sensitive play list generation for their MP3 players.

"Time and again I've seen how students at Queen Mary can really grow intellectually and go on to do great things with their lives. We also never forget that learning can be great fun too!"

in CCTV; HUMANIS, 3D models of deformable and articulated objects; ICONS, incident recognition for surveillance and security; APIDIS, autonomous production of images based on distributed and intelligent sensing; and VIGOUR, an Integrated Vision System integrating face detection, head tracking, human body modelling, feature extraction, and behaviour interpretation. These collaborative projects link the group with UK, EU, and US government and industrial partners as well as end users.

Staff research interests

Lourdes Agapito BSc MSc PhD(Madrid)
Senior Lecturer
3D reconstruction of deformable and articulated objects from video sequences, deformable shape modelling, non-rigid image registration, optical flow, dense 3D modelling

Professor Andrea Cavallaro MSc PhD(Lausanne, Switzerland)
Professor in Multimedia Signal Processing
Multimedia signal processing, object tracking, perpetual semantics and interactive media computing

Professor Shaogang Gong BSc(Electron Sci and Tech China) DPhil(Oxon) FIEE
Professor of Visual Computation
Computational vision and learning. One of the world's leading researchers on visual motion and video analysis, object and behaviour recognition

Professor Peter McOwan BSc(Edin) MSc(Aberd) PhD MSc(Lond) FBCS CSci CITP
Professor of Computer Science
Visual perception, mathematical models for visual processing, cognitive science and biologically inspired hardware and software

Fabrizio Smeraldi MSc(Genoa) PhD(Lausanne)
Lecturer
Pattern recognition and learning theory. The ultimate goal is to teach machines how to locate the interesting objects in an image and recognise what they are.

Tao Xiang BSc(Xi'an Jiaotong, China) MSc(CUC, China) PhD(NUS, Singapore)
Lecturer
Computer vision and machine learning. Applications include video analysis and abnormal video behaviour detection for visual surveillance.

Interaction, Media and Communication

The Interaction, Media and Communication (IMC) group is built around a shared interest in how technology makes new forms of human action and interaction possible. Combining ideas from the arts, engineering and science we examine how technology changes what it is possible for people to do, how they collaborate with others (real, robotic or virtual) and the new social economies they create. Our primary research areas are: human interaction, public engagement, advanced multi-modal interaction and social and ubiquitous computing.

We have built-up world class research facilities including ground-breaking new experimental platforms, the Augmented Human Interaction (AHI) Laboratory – that combines high quality motion capture equipment with novel 3D auditory and visual displays – and our new Performance Laboratory for studying multi-person, multi-modal interaction.

Our current grant portfolio of over £11m includes key projects on human-human and human-computer dialogue (DynDial), robot-human interaction (LIREC), interaction design for medical devices (CHI+MED), personalised live video streaming (My eDirector 2102) and social models to enable smarter mobility (SUNSET). We also host a world-leading science outreach activity: cs4fn (www.cs4fn.org) founding members of qMedia and jointly lead the Media and Arts Technology Programme (www.mat.qmul.ac.uk).

We publish our research in high-quality international journals and have a strong presence at international conferences in our area (eg, Cognitive Science and Human-Computer Interaction). We also chair important international conferences in our area (eg, SIGDial and Creativity and Cognition). Our innovative arts-science collaborations have been shown at the National Portrait Galley, the ICA, SHUNT, and festivals around the UK.

Staff research interests

Paul Curzon BA MA PhD(Cantab) PGCertHE FBCS NTFS
Reader
Interaction design, human error, medical device design, formal specification and verification, public engagement in science (cs4fn.org), computer science education

Professor Patrick Healey BSc DipAppPsych(Notts) MSc PhD(Edin)
Professor of Human Interaction
Technologies to enrich and transform human communication

Athen Ma BEng PhD(Lond)
Distance Studies Director
Social network analysis, complex network modelling and analysis, graph partitioning, community detection, personalisation, recommendation and delay tolerant networks

Stefan Poslad BSc PhD MIEEE(Newcastle)
Senior Lecturer
Ubiquitous computing; interoperability, orchestration of services involving semantic web and software agents; system management including security, safety, trust, privacy

Matt Purver BA MPhil(Cantab) PhD(Lond)
Lecturer
Computational linguistics, natural language processing, logical and statistical dialogue modelling to improve and support human-computer and human-human interaction

Research areas

Karen Shoop BA MSc PhD(Lond)
Teaching Fellow
Collaborative interaction and decision-making; social networks

Tony Stockman BTech PhD(Bradford)
Senior Lecturer
Design of interactive auditory displays for accessible and mobile applications

Laurissa Tokarchuk BA BSc(Saskatchewan, Canada) PhD(Lond)
Lecturer
Recommendation, multi-agent and tagging applications, artificial intelligence (including machine learning and planning), particularly in social computing; social network analysis, mining

Graham White BA(Oxon) SM(MIT) DPhil(Oxon)
Lecturer
Spatial and causal reasoning, the logic of explanation, and the application of category and type-theoretic techniques to reasoning about action

Multimedia and Vision (MMV)

Our Multimedia and Vision group's expertise is broad, ranging from multimedia coding to visual information retrieval. Our work includes scalable source and channel video coding, surveillance centric coding, object segmentation, and tracking for surveillance, multimodal signal processing, interactive media computing, semantic inference for visual information retrieval, multi-view based 3D modelling, pattern recognition, artificial intelligence and video processing for social networking.

Members of the group have published numerous technical papers, several of them in the highest ranked journals of the field, including the IEEE Transactions. We are currently cooperating with top academic institutions and industrial players world-wide, including research centres in France, the Netherlands, USA, and Germany.

We have developed practical applications for relevant multimedia systems including a complete framework for Scalable Video Coding and are contributing to other standardisation activities as JPSearch and MPEG-4/7/21. We are a member of the European Networked Electronic Media Platform and participate in a selected group of international experts making up the Future Media and 3D Internet Task Force of the European Commission.

Our current research portfolio consists of a healthy mixture of academic and industrial oriented research. We hold three EPSRC research projects and two substantial industry funded grants. Members of the group are currently coordinating the IST Network of Excellence 3DLife and participate in several large cooperative European projects including ADVISE, VideoSense, Saracen, NetxMedia, MISSA and Eternal.

Staff research interests

Pengwei Hao BSc MSc(NWPU, Xi'an, China) PhD(IRSA CAS Beijing, China)
Lecturer
Image coding, image retrieval, 3D modelling, mesh coding, colour imaging, non-photorealistic rendering and computer animation

Professor Ebroul Izquierdo BSc MSc PhD MBMVA FIEE SMIEEE(Humboldt, Berlin) CEng
Professor of Multimedia and Computer Vision
Visual information retrieval, scalable video coding and networking, social networks and 3D media processing

Ioannis Patras BSc MSc(Heraklion, GR) PhD(Delft, NL)
Lecturer
Computer vision, pattern recognition and artificial intelligence and their application in multimedia analysis

Networks

The Networks group was founded in 1987, and has since expanded greatly. We have an international reputation for excellence in bringing intelligence and performance assessment techniques to fixed and mobile communication networks.

The Group has a long-standing interdisciplinary collaboration with the School of Mathematical Sciences, supported by a succession of funded projects. This collaboration encompasses non-linear dynamics and experimental design, particularly as applied to optimising network measurement. We have been key players in many international collaborative projects, have a joint lab in Macao and are active in joint research with Beijing University of Posts and Telecommunications.

The wireless research in the group is growing rapidly and current research now covers areas including cognitive radio, self-organising radio resource management, semi-smart antennas for cellular coverage optimisation, energy efficiency and capacity improvements in wireless networks, cross layer design for end to end QoS provision, vehicular communication technologies, sensor networks and network security. Resource management, topology theory and resilience are other significant research areas within the group; these themes have been applied to various optical networks technologies as well as the overall internet.

Another area of strength is in developing appropriate methodologies for modelling network behaviour, with significant contributions to queuing theory, topology and traffic modelling, accelerated simulation and measurement. The group actively exploits its intellectual property, whether as patents (eg jointly with major equipment vendors), or in spinout activity, such as Actual Experience Ltd which is a software-based service business formed to commercialise research on the perceptual quality of networked applications.

Staff research interests

Eliane Bodanese BScEng MSc PhD MIET(Lond)
Lecturer
Intelligent mechanisms for control and management in wireless networks, QoS provisioning in communications, middleware development for distributed systems

Professor Laurie Cuthbert BSc(Eng) PhD CEng FIET MIEEE(Lond)
Professor of Electronic Engineering
Wireless networks beyond 3G, intelligent control of networks, radio resource management and quality of service

Paula Fonseca BSc PhD MIET(Lond)
Teaching Fellow
Previously worked for major Telecoms companies as R&D engineer, modelling IP Differentiated Services' control and implementing features for network switches

Ling Ma BEng MSc PhD(York)
Teaching Fellow
Context-aware information systems, acoustic environment classification, software engineering for mobile applications and content information retrieval

Raul Mondragon MSc PhD(Bris)
Senior Lecturer
Application of non-linear dynamics to network traffic and the development of chaotic control techniques to reduce end-to-end delay in packet traffic

Chris Phillips BEng PhD MIET(Lond)
Reader
Internet technologies, next generation optical networking, energy-aware resource management, body area networking and wireless sensor networks

Research areas

Professor Jonathan Pitts MEng PhD MIEEE(Lond)
Professor of Communications Engineering
Quality of service, perceptual quality, network performance, teletraffic analysis, accelerated simulation, traffic control, and resource management for converged network infrastructure

John Schormans BSc PhD MIET CENG(Lond)
Senior Lecturer
Modelling, probabilistic analysis, simulation and measurement of broadband packet networks, including wireless systems

Risk Information Management

The Risk Information Management Group undertakes leading-edge interdisciplinary research in decision analysis and risk, databases/information retrieval (including user-centred approaches), personalisation, learning, uncertainty, and bayesian methods. The Group's research involves numerous commercial partners and there are two companies Agena (www.agenarisk.com) and Apriore (www.apriorie.co.uk) which grew directly out of research by key members of the Group. Agena delivers Bayesian Network solutions, while Apriore delivers integrated database and information retrieval technology.

Much of the group's research involves combining data and human expertise to create intelligent solutions for high stakes decisions. In the area of risk assessment we work with practitioners to produce intelligent 'unified models', that use both data and expertise as inputs, to support expert decision making in multiple application domains. The group is currently working on improved decision making in medical, legal, systems engineering, security and safety applications.

The group's information retrieval work has created specialised search tools for applications including ecommerce, financial service portals, computer crime detection, as well as patient management in medical fields. Its research includes multimedia, XML, MPEG-7 and Web retrieval, knowledge-based uncertain reasoning, formal models and theories, integration of database and information retrieval technologies (probabilistic SQL), personalisation, document clustering and summarisation, evaluation of retrieval systems, information seeking, computational linguistics, and natural language processing.

Staff research interests

Silvano P V Barros BSc(Brun) MSc(UMIST/Brun) PhD(Brun)
Lecturer
Application of high performance and parallel computing techniques to improve retrieval performance

Professor Norman Fenton BSc MSc(Lond) PhD(Sheff) FBCS MIEE AFIMA CEng CMath
Professor of Computer Science
Intelligent decision analysis and risk, using Bayesian networks, with applications in medicine, law, critical systems and media personalisation

William Marsh MA(Cantab) MSc(Oxon) PhD(Soton)
Lecturer
Risk assessment and decision analysis with Bayesian Networks, specialising in system safety and medical decision-making

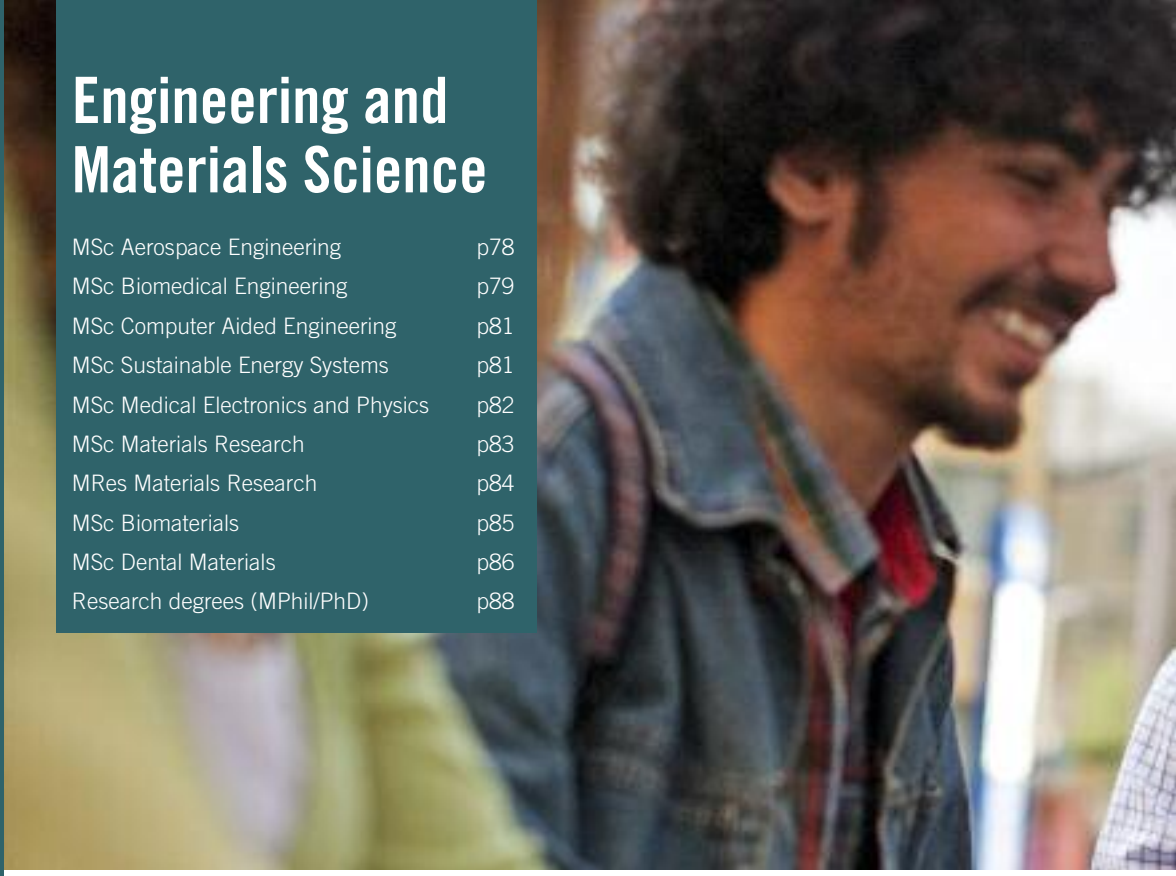
Professor Martin Neil BSc(Glasgow Caledonian) PhD(South Bank and Strathclyde) MIEE CEng
Professor of Computer Science and Statistics
Systems risk and software project risk assessment, operational risk in finance, and decision analysis with Bayesian Networks

Jane Reid MA(St Andrews) MSc(Glas)
Senior Lecturer
User-centred aspects of information seeking, information retrieval, structured document retrieval and human-computer interaction; pedagogical research

Thomas Roelleke Diplom-Informatiker Dr rer nat
Senior Lecturer
Information management based on the integration of database and information retrieval technologies

Tassos Tombros DipEng(Patras, Greece) MSc PhD(Glas)
Lecturer
Document clustering as a tool for effective document retrieval, query-based similarity measures and userbased automatic summarisation techniques

Engineering and Materials Science



Queen Mary's School of Engineering and Materials Science (SEMS) was formed in January 2007, bringing together two prestigious departments, Engineering and Materials. The School continues to push the boundaries of engineering and materials science, and is committed to internationally competitive research.

Research strengths

Engineering at Queen Mary has a distinguished tradition in both teaching and research, dating back to the beginning of the 1900s. Today, research at the College benefits from both excellent well-equipped laboratories and an extensive infrastructure of computational facilities. We have internationally renowned academics working in a diverse range of fields from aerodynamics and aerospace structures, to mechanical engineering, including thermodynamic principles, combustion and condensation heat transfer, electrospray technology and medical engineering.

Materials research has been carried out at Queen Mary longer than any other institution in the UK, and we have an international reputation for excellence in metals, polymers, composites, ceramics and adhesives. Biomaterials research, including tissue and cell engineering, orthopaedic implant design, biointerfical science and bio/nano science is performed under the auspices of the well-established Interdisciplinary Research Centre (IRC) in Biomedical Materials.

The School's research is coordinated within the following research groupings: • Biomedical Engineering and Materials • Energy Systems • Modelling and Simulation in Engineering Systems • Functional Nano-Materials

There is significant collaboration and interaction between academics working in multidisciplinary research areas. Research findings are incorporated into postgraduate

teaching, which means that our graduates learn about the very latest skills and advancements in each field, equipping them well for their future careers.

Postgraduate resources

Our postgraduate students enjoy a range of excellent resources, including:

- Comprehensive computing facilities: a SRIF-funded high performance computing cluster, several high-performance PC clusters and parallel SGI computer clusters, and an extensive network of Linux and UNIX workstations
- Extensive wind tunnel facilities: eight low-speed wind tunnels, a very low turbulence wind tunnel, three high-speed wind tunnels, computer-based flow control system with high-speed real-time data acquisition and processing system, colour and high-focused Schlieren systems, interactive aerodynamic simulator, PIV system
- Experimental thermofluids engineering facilities: heat transfer and condensation rigs, a large flume, six IC-engine test beds and three combustion rigs, laser doppler anemometry, electron microscopy gas/particulate-sampling and analysis facilities, several exhaust gas sampling and testing kits for engine and combustion emissions and thermal instrumentation
- Two new electrospray technology laboratories that were created with the support of the UK Joint Research Councils. The facilities include a wide range of instrumentation including a mass spectrometer capable of resolving high m/z particles up to 40,000, Fourier Transform Infra-Red Spectrometer, a wide range high voltage power supply and a high speed camera

Research quality indicators

Research Assessment Exercise

Materials research at Queen Mary was assessed as a top 5 activity in the 2008 RAE in terms of research power (quality multiplied by volume) of any materials activity in any university across the UK. The RAE also showed that 90 per cent of our research activity is internationally recognised, and that 55 per cent of our research activity is internationally excellent. The diverse nature of Engineering research at Queen Mary was assessed as 75 per cent internationally recognised, and 45 per cent internationally excellent. In addition, the research outputs from the Medical Engineering and experimental and Computational Fluids groups in Engineering were highlighted as being particularly strong.

Projects, funding, research grants and awards

The School of Engineering and Materials Science continues to gain valuable investment in its research. The School's research areas are supported by external grants from UK Research and Government Agencies including the Engineering and Physical Sciences Research Council (EPSRC), the Technology Strategy Board (TSB) and the European Union as well as from a multitude of industrial sponsors which fund postdoctoral research fellows, research students and overseas academic visitors.

In the twelve months up to 31st July 2010, the School's grant income was £3m. The sources of income include UK Research Councils, charities, private industry funding from the UK, European Union and outside the EU. Amongst the largest awards were £650,000 from EPSRC for the European Strategic Programme on Research in Information Technology, £450,000 from the Technology Strategy Board in association with private industry and the European Union's 7th Framework Programme (FP7) which brought in £750,000.

- A cell and tissue engineering suite: this houses cell culture labs, a molecular biology unit with quantitative rtPCR capability, and a radio-isotope labelling facility. A general purpose laboratory incorporates advanced mechanical test machines and standard biochemical/cell biology analysis equipment. The microscopy unit incorporates two confocal microscopes.

- The latest electron microscopes and a range of modern materials characterisation facilities including: FTIR and FT-Raman spectroscopy, x-ray fluorescence (XRF), inductively coupled plasma mass spectrometry, x-ray diffractometer (XRD),calorimetric (DTA, DSC) and thermomechanical (DMA, rheometer) techniques, analytical and computational facilities and image analysis, materials processing and fabrication, heat treatment equipment and dielectric and electrical characterisation.

Thanks to a Royal Society Wolfson Grant we recently opened new laboratories to support functional materials research. The laboratories will hold the latest processing and characterisation equipment for organic solar cells.

- A new NanoVision Centre enhances the experimental nanomechanics and high resolution imaging capabilities of the School. The centre houses two high resolution environmental scanning electron microscopes (SEM) one with an additional focused ion beam, a custom built atomic force microscope and a cryo-sample preparation stage. Both SEMs incorporate the latest STEM technology and are supported by transmission electron microscopy. Our scanning probe laboratory contains two low drift, high stability closed-loop Scanning Probe Microscopes (SPM).

Scholarships/studentships

Research Council Studentships (Home and EU students only)
These are the primary source of funding for Home and EU students and cover tuition fees and maintenance. The studentships are normally only available for candidates who have obtained a first degree of good honours standard. Scholarship information changes every year. Please contact the Research Administrator for current opportunities. See below for contact details.

Science and Engineering Scholarships (Overseas students only)
In recognition of the important investment that Overseas students are making in their education, we are pleased to offer scholarships of £1,500 or £3,500 per year to reward outstanding and exceptional achievement. For more information, see www.qmul.ac.uk/international/scholarships

Further information

For all MPhil/PhD admissions enquiries
Research Administrator
Tel: +44 (0)20 7882 8730
email: sems-recruitment@qmul.ac.uk

For all MSc admissions enquiries
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

General postgraduate information
Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel. +44 (0)20 7882 5533
email: admissions-teama@qmul.ac.uk

Graduate profile: Alves Nuno

Studied: BEng and PhD in Aeronautical Engineering

Currently: I work for British Petroleum as a reservoir engineer, analysing multi-phase flow behaviour in the oil field reservoir, helping to devise depletion strategies, well numbers and locations as well as working on surveillance activities during field operations. I work with geologists, geophysicists and petroleum engineers to ensure a coordinated cross-discipline decisions in multi-billion dollar projects.

Why did you choose Queen Mary for your postgraduate study?
I was invited to an open day for Aeronautical Engineering and was fascinated with the wind tunnels and laboratory equipment. This for me demonstrated Queen Mary's commitment to practical learning to complement the theoretical teaching. I also liked the fact that most faculties were in a single campus with good library at hand. This seemed indicative of a good studying environment.

What did you gain from your time at Queen Mary?
I learned a lot and made good friends in the almost eight years I spent as an undergraduate and then as a research student. I matured as a person, and learned how to manage my personal time and finances as well as how to deal with people from various backgrounds. I made many friends from students to lecturers, and we are still in contact today. I picked up good general engineering skills which have helped me as I moved into the oil industry and getting a degree from University of London has opened doors to me all around the world.

What are your career plans in the next five years?
I plan to remain working in the oil industry because I find the technical challenge very interesting. Another ambition of mine is to go back to teaching.

Careers

The School of Engineering and Materials Science maintains strong links with many industrial partners both in terms of research collaboration and funding, and through the Industrial Advisory Board which currently includes around 150 representatives from companies involved in the engineering and materials sectors.

Our annual school prize day offers an excellent opportunity for PhD researchers to present their projects for discussion to the industrial contacts and gain valuable feedback.

The School is proud to have the following programmes accredited by the Institute of Materials, Minerals and Mining (IOM3):

- MRes Materials Research
- MSc Materials Research
- MSc Biometarials
- MSc Dental Materials.

Work is in progress to gain accreditation for the remaining programmes. IOM3 accreditation contributes to the professional portfolio which enhances career prospects and can form the major component of an application for Chartered Engineer status. In addition, the School has links with Student Employment Services Limited (SES) who provide additional support in arranging postgraduate placements and work experience.

Postgraduates are also encouraged to join the various research institutes, which include:

- Institute of Materials, Mining and Minerals (IOM3)
- Institute of Mechanical Engineering (IMechE)
- Institute of Physics and Engineering in Medicine (IPEM)
- Royal Aeronautical Society (RAeS).

The strong industrial links fostered by the School, combined with the skills and training acquired during your postgraduate studies are highly valued by employers in all sectors of industry and academia.

Our graduates have been successful in finding jobs in a diverse range of interesting careers, both in the UK and worldwide. As an example our graduates have gained research, development and consultancy positions within companies such as Airbus, Corus, Rolls Royce, Dow Chemicals, DePuy, Avon, Bridgestone, SuperAguri F1, DSTL (Defense S T L) and many more.

In addition, many graduates of masters programmes have continued their studies to PhD level, either within Queen Mary, University of London, or at other prestigious universities around the world. Our PhD graduates have achieved success in a wide range of post-doctoral positions both within the world of academia and in research posts in industry.

Shahid Imran, PhD in ICE (Internal Combustion Engines)

"Queen Mary has a strong research group in the field of energy, which is what inclined me towards studying here.

"I started with an MSc in Sustainable Energy Systems – a course which is highly relevant as our globe is facing a unique energy crisis. This research effort is a contribution towards the development of alternate fuels.

"The College is supported by a strong faculty and state-of-the-art research facilities.

"Considering its teaching resources and study facilities, I would rate Queen Mary as a first-class institute. I have really enjoyed sharing my life with so many people from different cultural backgrounds."

Degree programmes

MSc Aerospace Engineering

One year full-time

Programme description

Aerospace engineering has come a long way since the Wright brothers first succeeded in powered flight in 1903. The subject has evolved and diversified, ranging in topics from aerodynamics and flight control to space engineering simulation and design. This diversity means that engineers need to be able to operate and develop advanced devices that are based on complex theoretical and computational models.

This programme aims to prepare specialists with advanced skills in computational modelling, numerical techniques and in-depth understanding in engineering approaches to aerospace problems, with particular emphasis on space, aerodynamics and flight simulation. Upon completing this programme you will be able to develop novel computational and technology products for the aerospace industries.

Programme outline

The programme includes two core modules, six module options and a research project.

Core modules: Mechanics of Continua • Research Methods and Experimental Techniques • Research Project (four modules)

Module options may include: Advanced Flight Control and Simulation of Aerospace Vehicles • Computational Fluid Dynamics • Advanced Topics in Aerodynamic • Aeroelasticity • Vehicular Crashworthiness • Computational Engineering • Combustion Concepts and Modelling • Robotics

Assessment

The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment and some or all of the work over the course of the programme will count towards the final mark. The Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements
Undergraduate degree (minimum second class honours or equivalent) in aerospace or mechanical engineering or a related discipline. Each application is individually assessed; you are recommended to write for guidance in specific cases. International students, please see the 'international students' section on page 144.

Recent graduate destinations
EADS (Airbus) • Air Europa • ISDEFE • BAe • Rolls Royce • Mott MacDonald

A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Biomedical Engineering

One year full-time

Programme description
Biomedical engineering is a new and rapidly emerging field of engineering that relies on a multi-disciplinary approach to research and development by applying the principles of science and engineering to biological and clinical problems. Problems in this area differ significantly from the ones associated with more traditional branches of engineering. Nevertheless, the biomedical engineer relies on methodologies and techniques initially developed for traditional engineering applications, which are further advanced and adapted to the complexities associated with biological systems. These applications vary from the design, development and operation of complex medical devices used in prevention, diagnosis and treatment, to the characterisation of tissue behaviour in health

Osnat Hakimi, PhD in Tissue Engineering

"I chose Queen Mary as I was excited by the idea of studying in a multi-disciplinary environment where engineers, chemists and biologists collaborate and work together.

"My project combines cell biology with material science. I am looking at the physical properties of silk, which is a very tough natural material, and at the interaction of cells with the silk.

"The programme is very interesting and also a challenge: as a PhD student I get a lot of responsibility, and can actively influence the direction of my project. Also, the informal, friendly atmosphere in the College is very stimulating, as you are constantly encouraged to share ideas and exchange knowledge.

"The laboratories I work in (medical engineering) are well equipped and excellently run. I also like the layout of the campus, as the library, lecture halls and offices are all within easy reach.

"Hoxton, Spitalfields, and Brick Lane are a stone's throw away, so you really get London at its best: the coolest bars, the liveliest clubs, the craziest art galleries, and most important – the best curries in town!"

Degree programmes

and disease, to the development of software products and theoretical models that enhance the understanding of complex biomedical issues.

This programme aims to prepare specialists with advanced skills sought by the biomedical industries and establishments, including experimental and numerical techniques, computational modelling and in-depth understanding of engineering approaches to biological problems. The acquired knowledge and skills would enable you to participate in the advancement of knowledge and technology in this field. Case studies originating in practical medical and industry problems are provided throughout the programme involving a range of clinical disciplines including orthopaedics, cardiovascular medicine, urology, radiology and rehabilitation.

The MSc in Biomedical Engineering is organised by a team of medical engineers within the School of Engineering and Materials Science, which has an internationally leading reputation in research, working closely with collaborators in Europe, US and Asia, on exciting research and development projects in this field. World-renowned specialists from the nationally leading Barts and The London School of Medicine and Dentistry provide vital contributions to the programme.

Programme outline

The programme includes three core modules, five optional modules and a research project.

Core modules: Mechanics of Continua • Research Methods and Experimental Techniques • Medical Ethics, Law and Regulatory Practice in Bioengineering • Research Project (four modules)

Module options may include: Biomechanics • Advanced Biofluid Mechanics • Tissue Engineering and Regenerative Medicine • Functional Materials in Medical Engineering • Principles and Applications of Medical Imaging • Biomedical Engineering of Urology • Implant Design and Technology • Clinical Measurements • Surgical Techniques

Assessment

The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment. The Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements

Undergraduate degree (minimum second class honours or equivalent) in Engineering or the Physical Sciences. Each application is individually assessed; you are recommended to write for guidance in specific cases. International students, please see the 'international students' section on page 144.

Recent graduate destinations

Graduates of this programme will find opportunities in a wide range of sectors. This includes medical-related positions, bio-industry, pharmaceutical companies, clinical research organisation dealing with testing and approval of new techniques. A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information

Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Computer Aided Engineering

One year full-time

Programme description

Computer Aided Engineering (CAE) is one of the strongest growing fields within engineering and underpins design and analysis in all engineering disciplines. Virtual prototyping, based on the numerical analysis of structures, fluids, acoustics and many other disciplines, has become absolutely central to the industrial design and analysis process. The skills and knowledge you will develop in this MSc programme will enhance your career prospects for employment in competitive industrial companies and research institutions.

This relatively new programme aims to provide you with a solid background in computational and numerical methods, as well as the relevant aspects of programming in modern programming languages such as C++. You will be introduced to a wide range of aspects of computation in engineering, both in structures and in fluids, including numerical optimisation. You will specialise in an engineering discipline chosen from aeronautical, mechanical, biomedical or sustainable energy engineering and will follow advanced modules in that specialisation. The numerical analysis skills you have gained are then applied to engineering problems in your specialisation for your final MSc project.

Research projects in CAE are drawn from a wide variety of applications in all of the specialisation areas, reflecting the strong research links that the staff members have with industrial companies such as Airbus, Alstom, Rolls Royce, TWI, and VW.

Entry requirements

Undergraduate degree (minimum second class honours or equivalent) in engineering or physics. Undergraduates with degrees in mathematics or computer science are also eligible, provided they have followed introductory courses in engineering basics such as fluid dynamics and continuum mechanics. International students, please see the 'international students' section on page 144.

Further information

Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Sustainable Energy Systems

One year full-time

Programme description

The MSc in Sustainable Energy Systems is an interdisciplinary degree addressing the scientific, engineering and technical aspects of global concerns about the availability of energy sources, sustainability of these sources through exploitation of new technologies or the preservation of existing sources, and environmental concerns. The impetus to specialise in this area stems from the large projected increases in global population and energy demand and is underscored by the need for new workable global supplies of affordable sustainable energy. These concerns elevate this energy need as perhaps the greatest single challenge facing the world in the Twenty-First Century. The current acute nature of the challenge results from the confluence of concerns about energy supply and demand, security, and the effects of energy production and use on the environment. As a result there is an increasing demand for postgraduates specialising in this field.

This programme will provide you with unique expertise in the fundamentals of energy and the environment. Specialist modules provide knowledge and understanding of existing technologies as well as the ability to contribute to the design and development of new technologies and devices in this field, to

Degree programmes

develop new technologies to extract energy from diverse energy sources and to use existing, and design new, energy conversion devices as necessary.

Programme outline
The programme includes two to four core modules, four to six module options and a research project. This is one of the few MSc Energy programmes to offer modules in all three main aspects of future sustainable energy systems: sustainable energy engineering; sustainable energy materials; and economics and management of sustainable energy.

Core modules: Advanced Environmental Engineering • Research Methods and Experimental Techniques • Engineering Thermodynamics (depending on background) • Mathematical Methods (depending on background) • Research Project (four modules)

Module options may include: Renewable Energy Engineering • Renewable Energy Materials • Sustainable Energy Economics • Advanced Fluid Mechanics and Heat Transfer • Combustion Concepts and Modelling • Advanced Propulsion • Piston Engines and Analysis • Advanced CFD • Advanced Aerodynamics

Assessment
The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment and some or all of the work during the module will count towards the final mark. The Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements
Undergraduate degree (minimum second class honours or equivalent) in engineering, physical sciences, mathematics or equivalent. Each application is individually assessed; you are recommended to write for guidance in specific cases. International students, please see the 'international students' section on page 144.

Recent graduate destinations
Increases in global energy demand led by developing and emerging economies highlight the need for new supplies of sustainable energy. This MSc qualifies graduates to take up research, development and consultancy positions within a wide range of companies. A large number of Queen Mary graduates also choose to continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Medical Electronics and Physics

One year full-time, two years part-time

Programme description
This programme was established in 1968 and has been tremendously successful in producing graduates equipped for careers in the healthcare profession. Designed to bridge the physical and engineering sciences with biomedical science and clinical practice, you will learn to apply the principles of these fields to the practical problems of biomedicine. You will focus on medical electronics, medical physics, physiology, physiological measurement techniques, and the design of instruments and safety of electronic devices. No previous biomedical knowledge is required.

You will broaden your knowledge of both electronic engineering and physics to encompass the aspects of both disciplines as applied to medicine. You will acquire the medical vocabulary you need to communicate effectively with clinical colleagues. In addition to lectures, you will work on a research project,

such as the design and development of a medical instrument, acquiring key skills in research techniques and project management.

Our association with a number of medical electronics and physics departments in local NHS Trusts, including Barts and The London School of Medicine and Dentistry, is of great benefit to students. You will be joining a School with well-established research groups in Medical Engineering and Biomaterials. On graduation from this programme, you will be in a position to make contributions to the advancement of medical science and technology that will genuinely benefit patients.

Programme outline

Core modules: Physiology • Surgical Techniques and Safety • Radiation Physics and Lasers • Digital Electronics • Research Techniques • Analogue Electronics • Ultrasound and Imaging • Clinical Measurements • Research Project (four modules)

Assessment

The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment and some or all of the work during the module will count towards the final mark. The Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements

Undergraduate degree (minimum second class honours or equivalent) in physics or an engineering discipline, other qualifications with relevant work experience may be accepted. International students, please see the 'international students' section on page 144.

Recent graduate destinations

Typically graduates find positions in the NHS or health sectors around the world. A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information

Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Materials Research

One year full-time

Programme description

This long established programme provides rigorous training in both theoretical and applied research for those who wish to pursue their career as a professional materials scientist. Technological advances, as well as methodological issues, have contributed to the transformation of materials and their functions. A number of challenges lie ahead, as manufacturing supply chains become global, involving companies in strategic alliances and partnerships. Materials research is of great use here, as competition can only be achieved through the development of innovative approaches to the design, development and manufacture of novel materials and their characterisation.

The MSc in Materials Research will provide an insight into areas of manufacturing, planning and control systems, knowledge based systems and measurements and manufacturing systems. The programme is interdisciplinary in nature and involves a combination of theoretical and practical approaches.

A substantial component of the programme is the research project. This is undertaken alongside taught modules throughout the academic year, and will be based within one of the materials-based research groups of the School of Engineering and Materials Science. The research project may be focused in the fields of Ceramics, Polymers, Composites, Elastomers, Functional Materials or Manufacturing Technologies.

Degree programmes

Programme outline
The programme includes four core modules, one module option and a research project.

Core modules: Research Methods • Materials Selection and Design • Operational and Financial Management • Research Project

Module options may include: Manufacturing Processes • Advanced Ceramics • Advanced Topics in Biomaterials • Thermodynamics and Kinetics of Phase Transformations • Composites • Environmental Properties of Materials • Nanotechnology and Advanced Functional Materials

Assessment
The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment and some or all of the work during the module will count towards the final mark. The MSc Research Project will be conducted under close supervision throughout the academic year, and is evaluated by thesis, presentation and viva examination at the end of the summer term.

Entry requirements
Undergraduate degree (minimum second class honours or equivalent) in materials science, engineering or a related discipline. International students, please see the 'international students' section on page 144.

Recent graduate destinations
Opportunities are available to work as materials scientists in a wide range of companies and sectors. A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735

MRes Materials Research

One year full-time

Programme description
The Research Masters (MRes) programme in Materials Research is designed following guidelines provided by the Engineering and Physical Sciences Research Council (EPSRC). It provides graduates with the foundations for a research career in industry, the service sector, the public sector or academia. It serves both as a qualification in its own right for an immediate entry into a research career or as an enhanced route to a PhD through further research.

The taught modules within this programme are designed to provide high quality training in the methods and practice of research, as well as providing complementary transferable skills through the optional modules which focus on business and management related topics.

A substantial component of the MRes Materials Research programme is the research project. This is undertaken alongside taught modules throughout the academic year, and will be based within one of the materials-based research groups of the School of Engineering and Materials Science. The MRes Materials Research may be focused in the fields of ceramics, polymers, composites, elastomers, functional materials or manufacturing technologies.

Programme outline
The programme includes three core modules, two module options and a research project.

Core modules: Research Methods • Materials Selection and Design • Research Project

Module options may include: Manufacturing Processes • Advanced Ceramics • Advanced Topics in Biomaterials • Thermodynamics and Kinetics of Phase Transformations • Composites • Environmental Properties of Materials • Nanotechnology and Advanced Functional Materialst

Assessment
The methods of assessment include coursework and formal examinations. Many modules will include continuous assessment and some or all of the work during the module will count towards the final mark. The MRes Research Project will be conducted under close supervision throughout the academic year, and is evaluated by thesis, presentation and viva examination at the end of the summer term.

Entry requirements
Undergraduate degree (minimum second class honours or equivalent) in materials science. International students, please see the 'international students' section on page 144.

Recent graduate destinations
Opportunities are available to work as materials scientists in a wide range of companies and sectors. A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Biomaterials

One year full-time

Programme description
"Biomaterials save lives, relieve suffering and improve the quality of life for a large number of patients every year." (Technology Foresight, UK) People are living longer and expect to be more mobile and active after injury or as they get older, therefore the demands for biomaterials and devices are increasing. Biomaterials combine engineering expertise with medical needs for the enhancement of healthcare. Biomaterials are either modified natural or synthetic materials which find application in a spectrum of medical implants for the repair, augmentation and replacement of body tissues. Queen Mary University of London has been a pioneer and led the field in teaching and research of biomaterials for over 28 years. In the early 1980s we were the first UK department to teach biomaterials modules and in 1991 the first to offer an undergraduate degree in the subject. This MSc programme will provide students with the knowledge in the field of biomaterials necessary to participate in biomaterials research or product development.

The MSc in Biomaterials has been designed for those with conventional materials expertise, or with expertise in engineering or medically related disciplines, who wish to facilitate their development into the biomaterials field. It provides an advanced level of understanding and appreciation of the principles and applications of biomaterials and their functional properties. You will learn about the function and application of biomaterials, their characteristics and their surface, physical and mechanical properties. You will study materials- and medicine-based modules, as well as those written specifically for the biomaterials programme. There are significant research elements in this programme including a research project based on the research interests of academic staff working in the field of biomaterials.

Programme outline
Core modules: Materials Research Techniques (two modules) • Biomaterials and Biomechanics • Application of Biomaterials • Materials Selection and Design • Advanced Topics in Biomaterials • Research Project (four modules)

Module options may include: Advanced Ceramics • Materials and the Environment • Composites • Rheology and Structural Properties of Advanced Materials • Nanotechnology and Advanced Functional Materials • Dental Materials

Degree programmes

Assessment
Methods of assessment include coursework and formal examinations. Many modules will include continuous assessment. The MSc Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements
Undergraduate degree (minimum second class honours or equivalent) in materials science, engineering or a related discipline. International students, please see the 'international students' section on page 144.

Recent graduate destinations
Opportunities are available to work as materials scientists in a wide range of companies and sectors. A large number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Dental Materials

One year full-time

Programme description
There have been exciting changes and improvements made to the Dental Materials programme this year. This course will now feature joint teaching within the School of Engineering and Materials Science. The aim is to integrate the resources available in the two schools to offer students a well rounded experience of the opportunities that are available in the fields of dental materials.

The MSc in Dental Materials is an advanced programme designed to develop a broad knowledge of the principles underlying the mechanical, physical and chemical properties of dental materials with special emphasis placed on materials-structure correlations in the context of both clinical and non clinical aspects. It provides the necessary tools and principles of dental materials that are currently used in clinical dentistry and covers the underlying principles of their functional properties, bioactivity and biocompatibility.

This programme will equip you with an overview of the field of dental materials and the knowledge necessary to participate in research or product development. The first portion of the programme will provide an introduction to materials science focusing on the major classes of materials used in dentistry including polymers, metals, ceramics and composites. The programme also covers specific dental materials applications such as drug delivery, and tissue engineering and regulatory affairs.

The MSc in Dental Materials is designed for dental surgeons, materials scientists and engineers who wish to work in the dental support industries and the materials health sector generally. There are significant research elements in this programme including a research project based on the research interests of academic staff working in the field of dental materials.

Programme outline
Core modules: Oral Biology: Surfaces and Interfaces in Dental Materials • Minimally Invasive Dentistry • Medical Ethics • Science of Biocompatibility

Module options may include: Biomineralisation and Biomimetics

Assessment
Methods of assessment include coursework and formal examinations. Many modules will include continuous assessment. The Research Project will be conducted under close supervision during the summer term and is evaluated by thesis, presentation and viva examination.

Entry requirements
Undergraduate degree (minimum upper second class honours or equivalent) in materials science, engineering, dentistry or a related discipline. International students, please see the 'international students' section on page 144.

Recent graduate destinations
Opportunities are available to work in the dental support industries and the materials health sector. A number of graduates also continue their studies to PhD level either at Queen Mary or at other prestigious universities in the UK or overseas.

Further information
Postgraduate Admissions Coordinator
School of Engineering and Materials Science
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

Graduate profile: Zeeshan Sheikh

Studied: MSc in Dental Materials

Currently: Assistant Professor in the department of dental materials and pre-clinicals at Altamash Institute. I am also working as an associate dental surgeon at the Altamash Dental Hospital.

Why did you choose Queen Mary for your postgraduate study?
The excellent research facilities along with an exceptional faculty were the major motivation for me wanting to secure an admission at Queen Mary, University of London.

What did you gain from your time at Queen Mary?
The MSc gave me the opportunity to learn some critical research skills which are helping me greatly in my professional life.

What are your career plans in the next five years?
My ultimate aim would be to amalgamate clinical and biomaterial research in Pakistan.

Research areas

We welcome postgraduate students and visiting research fellows to undertake research in our areas of interest (see below). Research students are registered for University of London degrees (MPhil/PhD) and work under the supervision of members of academic staff.

The School's research areas are supported by external grants from UK Research Councils and Government agencies including the Engineering and Physical Sciences Research Council (EPSRC), the Technology Strategy Board (TSB), the European Union and a multitude of industrial sponsors, which fund postdoctoral research studentships. A limited number of college studentships are also available.

Entry requirements
Students with first or upper-second class honours degrees or equivalent in a relevant subject area are eligible to apply for admission to research degrees.

For international students, please see the 'International students' section on page 144.

Biomedical Engineering and Materials

The complementary disciplines of materials science and engineering can provide understanding of complex, hierarchical systems in biological and medical sciences. The specific strategy of the group is to produce solutions to clinically relevant problems, through the study of normal and disordered tissue structure/function. An integrated multiscale approach is taken with respect to both structural organisation and reactivity of tissues studied from the nano- to the macro-scale. Examples include the modification of the stem cell niche, using both biomaterial and engineering cues, to explore their potential to differentiate into specific cell lineages for use in regenerative medicine. Specific areas of interest are the musculoskeletal, vascular and neuronal systems, aimed at a greater holistic understanding of the mechano-biological and electrophysiological tissue behaviour. Underpinning this strategy is an effort to advance experimental techniques, both within the School, across the College and through use of UK central facilities. The group is also involved in advancing new diagnostic tools and techniques, which range from spectroscopic analysis of cancer tissue in vitro, in vivo sensors to microcapsules for the delivery of biological agents. The experimental approach is supported by a considerable utilisation of in silico modelling designed to predict early damage or disease, thereby developing the potential for regenerative medicine strategies. Ultimately, a progression to direct medical application is anticipated. Future biomaterial developments include smart nano-patterned polymeric materials for development of new blood vessels, bioactive nanocomposite coatings for enhanced hip prostheses, novel bioceramics for hard tissue repair and bone tissue engineering, which can be evaluated with both laboratory-based tests and animal models. New generation materials can be developed by Queen Mary-associated companies such as Progentix Orthobiology and Apatech, the latter having recently been acquired by Baxter International.

Energy Systems

This area applies engineering and scientific disciplines in wind turbines, solar and geothermal energy, generation and use of alternative future fuels, and novel powerplants and thermodynamic cycles. Established directions of heat transfer research have expanded in the areas of nanofluids and interaction with materials for solar panels. Research in aerodynamics, turbomachines and novel powerplants is ongoing, and we are expanding into wind turbine applications and combined solar powerplants, blade materials and distributed power control. We have recently expanded in the areas of alternative and surrogate fuel generation (biofuels, hydrogen from artificial photosynthesis, and surrogate fuels), renewable materials, life-cycle engineering and waste remediation. There are significant activities in recycling of polymers and rubbers. The group has a strong international reputation in biobased and biodegradable composite materials, these are being developed based on bioplastics in combination with natural fibres such as flax, hemp or nano-sized cellulose whiskers, fully recyclable self-reinforced polypropylene (SR-PP) or 'all-polypropylene' composites that has been a major innovation in the area of engineering plastics and is now commercialised under the name PURE® by Pure-Composites and Tegris® by Milliken.

Modelling and Simulation of Engineering Systems

In recent years, computational modelling and simulation has become one of the leading fields in engineering. In some industries, a shift from development based on physical prototyping to that driven by computational approaches has been realised due to the increase of computational power (software/hardware). This ongoing process is strongly driven by academic research often in close collaboration with industrial software developers. In the area of solid mechanics was dominated by Finite Element Methods (FEM) but it became clear that these approaches need to be accomplished by other methods –

Research areas

eg Discrete Finite Element Method (DFM), Boundary Element Method (BEM), Meshless Methods. For fluid problems, computational fluid dynamics (CFD) is well established with research now focusing on specialised and more advanced fields like LES (Large Eddy Simulation) and DNS (Direct Numerical Simulation). Using these methods a second more goal-directed group is developed, which enables us to identify optimal and robust designs. Here, deterministic and stochastic methods are developed (particle swarm methods etc). The gradient information for sensitivities and optimisation are obtained by adjoint methods and automatic differentiation. Challenges can be found in topology optimisation addressing highly nonlinear problems (crash, turbulent fluids), shape optimisation, complex structures (complete car bodies for crash, aerodynamics, etc) and combining robust design with reliability.

Functional Nano-Materials

The development and understanding of nanostructurised materials overlaps with other research groupings within Queen Mary. A large area of research is in nanocomposites. A major research effort is around the creation of multi-functional polymeric materials based on carbon nanofillers such as carbon nanotubes, graphene and carbon black. Research in carbon nanostructures ranges from synthesis and electrical properties to applications and is studied in collaboration with the Physics Department. A specific area of interest is higher-order fullerenes filled with guest atoms and electronic properties of nanotubes. Extensive research activity involves the application of carbon nanotubes in polymer composites for the creation of multi-functional materials with interesting mechanical, electrical, thermal and optical properties. A very distinctive area of research that has recently been introduced to Queen Mary is that of micro- and nano-encapsulation. This work is based on a layer-by-layer (LbL) adsorption approach utilising oppositely charged polyelectrolytes on colloidal template particles, including emulsions and gas bubbles.

Imaging is a strength of both the School and the College. Within the School, nanoscale imaging is exemplified by the NanoVision Centre where the development of new techniques has been associated with 3D imaging of biological tissue and integrating different technologies to produce new approaches to imaging and nanomechanics.

Nanoforce

Application of the team's research is significantly enhanced by the creation of Nanoforce Technology Ltd, a wholly-owned Queen Mary subsidiary devoted to nanomaterials research for exploitation by industry. Nanoforce provides access to a broad range of unique world-class processing facilities, such as spark-plasma sintering for development of nanoceramics and dedicated equipment for production of polymer nanocomposites.

Staff research interests

Professor Theodosios Alexander (a.k.a Professor Theodosios Korakianitis) BSc(Newcastle) SM SM SM(MIT) ScD(MIT)
Professor of Energy Engineering
Energy engineering, turbomachines, piston engines, airfoil and blade design, cardiovascular system, cardiac assist/prosthetic devices

Eldad Avital BSc(IITHafia) MSc(Tel Aviv) PhD(Lond) SMAIAA
Reader in Computational Fluids and Acoustics
Fluid mechanics, computational aero-acoustics, aerodynamics, flow control, simulations, hydrodynamics, water wakes

Asa H Barber BSc MSc PhD(Lond) DIC
Senior Lecturer
Nanomechanics of synthetic and biological composites, polymer surfaces and interfaces, electron and scanning probe microscopy

Professor Cees Bastiaansen BSc, PhD
Professor of Materials
Functional polymers, cholesteric films and fibres, polymer fibres, polymer actuators, liquid crystal polymers

John Behiri BSc PhD(Lond)
Senior Lecturer
Structure and mechanical properties of bone, bone cements

Emiliano Bilotti PhD
Academic Fellow
Synthesis and characterisation of polymer nanocomposites, conductive polymer composites, smart textiles, bioinspired materials, bacterial cellulose composites, nano-mechanical tests

Adrian Briggs BSc(Eng) PhD(Lond)
Reader in Mechanical Engineering
Enhanced heat transfer, two-phase flow, condensation

James Busfield MA PhD(Lond) MIMMM CEng
Reader in Materials
Strength, fatigue, dynamic, frictional and abrasion properties of rubbers, nanostructured fillers, smart elastomers

Andy Bushby BSc PhD(Lond),
Reader in Materials
Nanomechanics, electromicroscopy

Tina Chowdhury BSc MSc PhD(Lond)
Lecturer in Musculoskeletal Science
Bioreactors, mechanotransduction, inflammation, osteoarthritis

Peter Dabnichki BSc MSc(Sofia) PhD(BAS)
Senior Lecturer in Medical Engineering
Biomechanics, mathematical and computer modelling, medical systems, biological systems, intelligent systems

Professor Joost de Bruijn BSc PhD(Leiden)
Professor of Biomaterials
Bone replacement, stem cells, tissue engineering, regenerative medicine, calcium phosphates, osteoinduction, bioreactor

Graham Dorrington BSc(Soton) PhD(Cantab)
Senior Lecturer in Aerospace Design
Airships, fixed wing aircraft, reusable launch vehicles, flow control, aerodynamics, dendronautics

Fabian Duddeck Dr Ing habil
Reader in Computational Mechanics
Crashworthiness, car body design, optimisation, robust design, boundary element methods, finite element methods

Steve Dunn BSc MSc PhD (MInstP, FION, FIMMM, FHEA)
Senior Lecturer in Renewable Materials
Photochemistry, photovoltaic, complex oxide materials and semi-conductor materials

Himadri Gupta MSc PhD
Lecturer in Biomaterials
Mechanical characterisation combined with synchrotron small angle X-ray diffraction, Microstrain mapping, structure/function relations at the nanoscale in biological composites, synchrotron scanning microbeam scattering and diffraction

Karin Hing BSc PhD CEng MIMMM FRMS
Senior Lecturer in Biomateials
Processing, characterisation and evaluation of biomedical materials and development of porous bone graft substitutes and tissue engineering scaffolds; cell response; Hard and soft tissue repair and evaluation

Henri Huijberts MSc PhD(Twente, Netherlands) CMath FIMA SMIEEE
Reader in Control and Dynamics
Nonlinear control systems, nonlinear dynamics, chaos, synchronisation, robotics, time-delay systems, power control in ad-hoc networks, traffic dynamics

Martin Knight BEng MSc PhD(Lond)
Reader in Mechanobiology and Director of Admissions
Mechanotransduction, mechanobiology, intracellular calcium signalling, cell mechanics, cytoskeleton, cartilage, neurones, confocal microscopy

Staff profile: Himadri S Gupta

Lecturer in Biomaterials

"My research is focused on the structure-function relations at the micro- and nanoscale in biomineralized systems like bone. Such systems are highly hierarchical in their architecture and are optimized to function at each length scale. Using novel synchrotron-based techniques for combining micromechanics with real-time nanostructural investigations, my team is seeking to understand the supramolecular mechanisms that make such materials resistant to fracture. We have published our work in journals such as Nano Letters, Proceedings of the National Academy of Sciences, Journal of the Royal Society Interface, Journal of Structural Biology and Bone.

"I find it a challenge to apply and modify complex techniques from materials science and modelling to look at materials that nature has made and see how they function. From a medical perspective, my work is concerned with understanding quantitatively how changes in composition and structure at the nanoscale in bone diseases (eg osteoporosis) and ageing can affect mechanical properties. Such information is important for the design of effective clinical strategies against these conditions. From a materials science viewpoint, the best outcome of my research would be models or design principles for biologically inspired composite materials for use as bone and tissue replacements.

"Queen Mary offers an excellent research environment, with expertise in a range of topics from materials for aerospace and fuel technologies, to biomaterials. It also has some unique experimental facilities for nanomechanics and characterisation, for example at NanoVision, as well as strong links to industry, and an interdisciplinary centre for biomaterials."

Research areas

Steffi Krause Dr rer nat (Humboldt University Berlin)
Reader in Analytical Systems
Electrochemistry, impedance imaging by photocurrent measurements at field-effect capacitors, field-effect gas sensors, biosensors, enzyme detection, quartz crystal microbalance

Professor David Lee BSc(UCW, Aberystwyth) MA PhD(Lond), Head of School and Professor of Cell and Tissue Engineering
Mechanobiology of musculoskeletal tissues; tissue engineering; stem cell biology; biomaterials; bioethics

Terese Lovas CandMag CandScient PhD(Lund, Sweden) MIoP
Lecturer in Energy Engineering
Energy, combustion, turbulent flows, chemical kinetics, emission control, atmospheric dispersion

Yiling Lu BSc(USTC) PhD(Lond)
Lecturer in Bio-Fluid Mechanics
Poroelastic theory, cell and tissue biomechanics, haemodynamics, finite element method.

Fariborz Motallebi PhD(Liv)
Senior Lecturer in Aerodynamics
Flow control, aerodynamics of sport vehicles, high speed aerodynamics, boundary layer flows, instrumentation and optical diagnostics in flow measurements

Jens-Dominik Mueller Dipl-Ing(Munich) PhD(Michigan)
Senior Lecturer in Bio-fluids
Computational fluid dynamics, fluid-structure Interaction, biofluids, shape optimisation, adjoint methods, mesh adaptation

Professor Ante Munjiza PhD(Tohoku University Japan, Swansea UK), PostDoc (MIT, USA)
Professor of Computational Mechanics
Finite element methods, discrete element methods, molecular dynamics, structures and solids, structural dynamics, fracture, fragmentation, particular matter, software engineering, blasts, impacts, nanomaterials, parallel and grand scale computations, complex systems modelling

Professor Nobuoki Ohtani MDes(RCA)
Professor of Design
Sports equipment design, medical design, design innovation, electric vehicle design, design management

Professor Ton Peijs BSc PhD(Eindhoven)
Professor of Materials
Composite materials, nanocomposites, high-performance fibres, biobased materials, polymer technology

Stuart Peters BA MSc PhD(Brunel), Lecturer
Systems of innovation, long run evolution of technologies, flat panel displays, polymer technology

Mike Reece BSc PhD(Essex) PGCE MIMMM
Professor of Functional Ceramics
Functional ceramics, single crystals and thin films: ferroelectric, ferroelastic, piezoelectric, sensors and actuators, domain dynamics, rapid sintering

Hazel Screen BEng MRes PhD(Lond) CEng MIMechE MIPEM
Senior Lecturer in Biomedical Engineering
Connective tissue mechanics, microscale and nanoscale mechanical properties, mechanotransduction, tendon diseases and tendinopathy

M Hasan Shaheed BSc MSc(Dhaka) PhD(Sheff) MIEE MIEEE
Lecturer in Control and Robotics
Robotics, nonlinear system, system identification, modelling, optimization, control, artificial intelligence, neural networks, wavelets, fuzzy logic

Professor Julia Shelton BA(Cantab) PhD(Lond)
Professor of Biomechanical Engineering
Wear of total hip replacements, surface coatings, particle analysis, orthopaedic systems, tissue engineering, tendon mechanics

Professor John Stark JPW BSc(Exon) MSc(Manc) PhD(Lond) FRAS FRAeS
Professor of Aerospace Engineering
Electrospray technology, spacecraft propulsion, spacecraft design, direct printing

Professor Gleb Sukhorukhov MSc PhD
Professor of Biopolymers
Nanocapsules, layer-by-layer, colloids, core-shell structures, polyelectrolytes, thin films, ultrathin coating, nanoparticles, microencapsulation, drug delivery systems, controlled release, nanoscaled materials, composite materials, multifunctional nanosystems, remote controlling

Professor Pankaj Vadgama MB BS BSc PhD FRCPath CChem FRSC CPhys FInst FIM CSci
Director of the IRC in Biomedical Materials
Biosensors, membrane technology, microfluidics, surface biocompatibility, electrochemistry, biomaterials

Ranjan Vepa BTech(IITMadras) MASc(Wat) PhD(Stan)
Lecturer in Avionics
Simulation, control engineering, aeroelasticity, smart structures, flow control, biomimetic robotics, biomedical control systems

Alexander Vikhansky PhD(BGU)
Academic Fellow
Laminar microflows, mixing, Monte Carlo, granular media, non-linear dynamics, lattice boltzmann equations

Hua Sheng Wang BSc MEng PhD(XJTU)
Lecturer in Energy Engineering
Enhanced heat transfer, condensation and boiling, HVAC, refrigeration, renewable energy, bioheat and mass transfer

Professor Wen Wang BSc DIC PhD(Lond)
Professor of Biomedical Engineering and Dean of Faculty of Engineering and Mathematical Sciences
Vascular endothelial mechanics, flow and solute transport in extracellular matrices, microcirculation, arterial haemodynamics, cell an tissue mechanics

Staff profile: Martin Knight

Reader in Mechanobiology

"I have always been interested in medical engineering and the idea of designing products that can be used within the medical field to improve people's lives, whether this is implantable devices, diagnostic systems or rehabilitation equipment. In addition I have a passion for research. In my case, I am interested in how living tissues and cells respond to mechanical forces. In particular I am focused on articular cartilage, the specialised tissue that covers the ends of bones within synovial joints such as the hip and knee.

"I hope to be able to use my research to develop new treatments for painful and debilitating conditions such as osteoarthritis. In addition, I hope that my work in medical engineering design will lead to the development of new medical technology.

"I try to integrate my research interests into my lectures and hope that my enthusiasm for both research and medical engineering design rubs off on my students. I am also heavily involved in the admissions process and enjoy interacting with potential students to explain the importance of medical engineering and scientific research for developing the future of medicine.

"At Queen Mary, we have two of the best medical engineering undergraduate and postgraduate degree programmes in the UK with fantastic facilities, excellent medical and industrial links and a large multidisciplinary group of academics. This enables us to provide students with experience in a wide range of medical engineering related topics from implant design to tissue engineering and biomechanics to biomaterials. In addition we have excellent student employment record. All this makes for a dynamic and exciting place to work with a friendly atmosphere."

Dongsheng Wen BEng MEng DPhil(Oxford) CEng CSci FIoN MEI
Reader in Future Energy
Future energy and fuels, nanotechnology and nanoscience, flow and heat transfer, cryogenics

Pihua H Wen BA MSc(CSU, China) PhD(WIT, Southampton)
Reader in Computational Solid and Fluid Mechanics
Solid and Fluid mechanics, fracture and damage, computational methods, numerical simulation in manufacturing and engineering

Dr Andrew Wheeler MEng PhD
Lecturer in Aerospace Engineering
Gas turbine aero-dynamics and heat-transfer, high pressure transonic turbines and high pressure compressors

Professor John Williams BSc(Aston) BSc(Lond) PhD(Aston) FIMA CEng CMath MICE MIWEM
Professor of Computational Fluid Dynamics
Computational fluid dynamics of environmental flows, large eddy and direct numerical simulation of free-surface flows, modelling of flow in compound channels, over rough beds and submarine fins

Haixue Yan PhD
Academic Fellow
Ceramics processing and characterizations, spark plasma sintering, nano, ferroelectrics and piezoelectrics

Lewis Tunnicliffe,
MRes Materials Research

"I chose to study at Queen Mary for a number of reasons. Firstly, the College's reputation as a research-intensive university, and secondly the Department's strong background in composites – my area of interest. Furthermore my project work has industrial funding through the College.

"On top of that, the campus is great with lots of cafes and places to eat as well as Qmotion – the gym, the library and department all in one place. There are also good transport links into central London.

"The research project component of my course allows me considerable freedom to investigate my chosen area and use all the relevant experimental techniques available in the department. The academic facilities are very good, and the lecturers are friendly and enthusiastic about their subjects.

"I have attended conferences relevant to my area of materials research during which I was able to discuss aspects of my work with academics and industrial scientists."

Mathematical Sciences

Mathematics has been taught at Queen Mary since 1887. Active in research since the 1950s, and with the Astronomy Unit founded in 1966, the School of Mathematical Sciences boasts a long and proud history. As one of the largest mathematics departments in the UK, with over 50 members of staff, the School can offer energetic and diverse postgraduate activity across the spectrum of mathematical sciences from pure and applied mathematics, finance and statistics to astronomy. Our staff includes international leaders in many areas of mathematical research, and the School is a hive of activity, providing a vibrant postgraduate life.

Research strengths

We have over 60 students currently studying for PhDs. The disciplines covered include combinatorics, group theory, computational group theory, non-commutative geometry, applications of graph theory, representation theory, analysis, complex iteration, dynamical systems, critical infrastructure of networks, statistical mechanics, design of experiments, Bayesian statistics and biostatistics, combinatorial and statistical design theory, relativity, cosmology and the early universe, solar and space physics, solar system dynamics, the formation of extrasolar planetary systems, and survey astronomy.

Many academic visitors come to the School, for either short visits or longer periods, and it hosts numerous postdoctoral research staff, many of

them funded by Research Councils or similar bodies. This all contributes to our rich academic atmosphere.

Staff from the School also travel widely to attend conferences and conduct research with international collaborators which ensures that we remain at the forefront of activity in all the School's fields of interest. For similar reasons, the School is generous in supporting research students' attendance at national and international conferences.

Postgraduate resources

There are formal and informal seminars, colloquia and small study groups in the various areas of the School's research activity – many in collaboration with other colleges of the University of London.

In addition, there are many discussions over coffee in the School Common Room. Research students and staff participate in all these activities. Research students and staff participate in all these activities.

We have excellent computing facilities, and all full-time research students have a work station on their desks. MSc students share a large office with a dedicated computer network. The College Library takes many mathematical, statistical and astronomical journals which are supplemented by an extensive electronic periodicals library. There are also exceptional libraries in other London University Colleges as well as The London Mathematical Society Collection, the Royal Astronomical Society Library and the Royal Statistical Society Library.

We expect to be able to offer on-campus accommodation to most new full-time postgraduate students coming from outside the London area. Please apply as early as possible.

Research quality indicators

The Research Assessment Exercise
The School makes a return under four headings or 'Units of Assessment': Pure Mathematics, Applied Mathematics, Statistics and Operational Research, and Physics. The Research Assessment Exercise 2008 showed that 90 per cent of research activity at Queen Mary in these units of assessment is internationally recognised, and over 50 per cent is internationally excellent.

Projects, funding, research grants and awards
The School provides an excellent environment for research. We have one of the leading Pure Mathematics groups in the country, and have substantial EU and EPSRC funding grants running until at least 2014. Funding of Applied Mathematics has remained strong, and the applied group is responsible for over £2m in grant income in the burgeoning area of complexity science. The Statistics Group has a strong international status in the design of experiments and is currently supported by EPSRC, with £470,000 coming from one grant alone. In 2011 we made substantial further investment to attract world-leading researchers.

Queen Mary is a member of the SEPnet, a consortium of six partner universities working together to advance and sustain Physics as a strategically important subject for the UK economy and its science base in the South East Region of England. The Astronomy Unit led the construction of VISTA (the Visible and Infrared Survey Telescope for Astronomy), which is revolutionising infrared survey astronomy. It has further increased its international profile through major participation in the ESA/NASA space missions Cassini, Cluster and CoRoT, with major roles in mission planning and data handling, as well as scientific output.

Scholarships/studentships

The School is normally able to offer about ten fully-funded research studentships to MPhil/PhD applicants each year. Some of these are funded by UK Research Councils (EPSRC and STFC) and are restricted to UK or EU citizens, while others are aimed at international applicants. The remaining studentships are funded by Queen Mary: these are available for mathematics, statistics or astronomy and have no nationality restrictions.

Further studentships are offered from time to time, supported by various funding agencies (eg CASE studentships, Research Council Project Studentships, and studentships supported by charitable foundations). Graduate students are offered the possibility of earning extra income from marking undergraduate work and/or teaching undergraduate exercise classes within the School.

If you are interested in applying for support you should contact the Postgraduate Admissions Tutor for mathematics, statistics, or astronomy through the Administrative Officer for Postgraduate Studies and Research.

Further information

Administrative Officer
(Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: maths-pg@maths.qmul.ac.uk
astro-pg@qmul.ac.uk

General postgraduate information
Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teamb@qmul.ac.uk

Careers

One obvious reason for undertaking an MSc or PhD in the School of Mathematical Sciences is with a career in academia in mind. A significant number of our MSc graduates go on to study for a PhD at Queen Mary or elsewhere, and many of our PhD graduates embark on careers in university research and teaching – we have graduates in distinguished positions in universities at home and abroad.

However, MSc and PhD graduates in mathematics, statistics and astronomy or astrophysics also have wide career opportunities in finance, industry, and the public sector. The analytic and computing skills acquired by these students in their studies are much valued in the financial sector and a number of recent PhD graduates have gone to work in investment banking, just down the road from us in the City. Among career choices of recent MSc graduates are financial modelling, the Civil Service and FE teaching. Part-time MSc students include school teachers who continue to work while studying.

There is a global shortage of well-qualified statisticians, and PhD graduates in Statistics have a wide variety of job opportunities in which to apply their professional expertise. Recent PhD graduates have gone on to work for pharmaceutical companies, the NHS and the financial services industry, as well as in universities.

Some specific examples of graduate destinations are as follows: • Civil servant, Office of National Statistics • IT software engineer, Nokia • Data analyst, Greater London Authority • Database analyst, Legal and General • Lecturer, University College Cork in the Republic of Ireland • Teacher, Watford Grammar Schools for Girls • Principal research statistician, British Telecommunications PLC • IT consultant, HSBC Bank PLC • Statistical advisor, Infineum UK Ltd (a world-class developer, manufacturer and marketer of petroleum additives)

Graduate profile: Cheng Yeaw Ku

Studied: MSc and PhD in Mathematics

Currently: Visiting Fellow in the Department of Mathematics at the National University of Singapore

Why did you choose Queen Mary for your postgraduate study?
Queen Mary has world-class mathematicians. Just like playing chess, it is important that I learn from the master.

What did you gain from your time at Queen Mary?
I gained the opportunity to work with experts in the area which I was interested in. I also enjoyed and learned a lot from the courses and seminars at Queen Mary. They were foundational for my continuing research in mathematics.

What are your career plans in the next five years?
Recently, I have become interested in stochastic calculus and its application in financial engineering and investment. With emerging financial markets in Asia, I plan to become a quantitative analyst in the next five years in Asia.

Degree programmes

MSc in Mathematics

One year full-time, two years part-time

Programme description

The MSc in Mathematics gives an in-depth training in advanced mathematics or advanced mathematics and statistics to students who have already done very well in a first degree with high mathematical content. Students successfully completing the MSc will acquire specialist knowledge in chosen areas of mathematics and statistics, and the MSc is an excellent preparation for those who are considering pursuing research in mathematics.

The main areas that may be pursued within this MSc are pure mathematics (especially algebra and combinatorics), probability and statistics, dynamical systems and astronomy. The MSc programme is very flexible, and in consultation with your adviser you may choose modules in different areas or specialise in one.

Programme outline

You will normally take eight taught modules in total, with one such module typically comprising 24 hours of lectures and 12 hours of tutorials given during a twelve-week semester. In addition to the MSc modules offered at Queen Mary, you can also choose from an extremely wide range of advanced mathematics modules offered at other Colleges of the University of London. During the summer period, supervised by an academic member of staff, you are required to complete a dissertation, working largely independently in an advanced topic in mathematics or statistics. For details of modules typically offered, see www.maths.qmul.ac.uk/postgraduate/msc-maths-stats/modules

Assessment

Examinations are held between May and early June on the modules taken. Dissertations are evaluated in September. Successful completion of the MSc programme will result in the award of the degree of MSc in Mathematics (possibly with Merit or with Distinction).

Entry requirements
The normal entry requirement for the MSc in Mathematics is the equivalent of a British first or good upper second class honours degree in mathematics, or in mathematics with another subject, such as statistics, philosophy, physics or computing. In addition, the undergraduate modules you have taken must provide sufficient background to enable you to take an appropriate selection of our MSc modules.

International students, please see the 'international students' section on page 144.

A limited number of £1,000 scholarships will be available for highly qualified self-funded MSc applicants. No further application is required for these scholarships.

Recent graduate destinations
Graduates of the MSc in Mathematics have gone into a wide variety of careers, including those in the Government Statistical Service, NHS Management, and even the US Air Force. Many of our graduates have taken up teacher training, leading to jobs teaching mathematics and statistics. A significant number of our graduates have gone on to pursue PhD studies.

Further information
Administrative Officer
(Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: maths-pg@maths.qmul.ac.uk

MSc in Mathematical Finance

One year full-time, two years part-time (Subject to approval)

Programme description
The MSc in Mathematical Finance is a specialist masters programme aiming at providing graduate students and professionals with a rigorous training and strong analytical and quantitative skills in finance. The intensive programme will introduce you to the mathematics used by practitioners in the field. It covers a wide range of analytical tools applied in quantitative asset pricing and financial derivatives.

Sally Gatward, PhD focusing on Lambda-trees and Braid Groups

"Queen Mary offered me funding to continue my research, and it was a fantastic opportunity.

"There are many good lectures that I can go to, without having to worry about exams, on subjects in my area, and there are weekly algebra and pure maths seminars. I find this a sociable and friendly place to work. I especially enjoy working in Room 201 in the Maths Department, my office. I share it with about ten other postgraduates, all working in my area, and we all get a desk and a computer each. It is big and has big windows, south facing. I find the atmosphere in there sociable and work friendly.

"I joined the women's football club and the music society, which has both a choir and an orchestra. All three clubs have been very friendly and I have made good friends there."

Graduate profile:
David Mulryne

Studied: PhD in Theoretical Cosmology

Currently: I was a postdoctoral research associate in Professor Hawking's group in the Department of Applied Mathematics and Theoretical Physics at the University of Cambridge. I am now back at Queen Mary as a postdoctoral research assistant.

Why did you choose Queen Mary for your postgraduate study?
For me it was important to be in a department with a good research reputation for the field I wanted to specialise in, but also one which I felt had a friendly, relaxed and enjoyable atmosphere. The Astronomy Unit fulfilled these criteria.

What did you gain from your time at Queen Mary?
Apart from a PhD, my time at Queen Mary has left me with lasting friends, both among the staff and fellow postgraduate students, and many rewarding and enriching experiences. Queen Mary really is a melting pot of people from many diverse cultures, making it a very special and interesting place to be.

What are your career plans in the next five years?
I am currently in the second year of my second postdoctoral research post. My goal is to eventually get a permanent position somewhere.

Degree programmes

The programme is designed for high-calibre science and engineering graduates who aim to pursue careers as quantitative analysts in the private sector, government or financial institutions. You will learn about financial modelling, asset pricing theory, and financial risk management, as well as more theoretical subjects such as the theory of stochastic processes and stochastic analysis. Scientific computing and programming is an important element of this programme.

Programme outline
The study programme consists of six core modules and two electives with an even split between semesters, and a summer dissertation project. You will also be offered two pre-sessional modules in probability/statistics and financial markets and economics providing a good opportunity to enhance the necessary prerequisite knowledge. Three core mathematics modules run by the School of Mathematical Sciences will cover the most important mathematical techniques used in mathematical finance. Three core economics modules will cover the relevant financial instruments, and will be run by the School of Economics and Finance. You can choose elective modules from a list of around ten modules offered by the two schools.

Assessment
Examinations are held between May and early June on the modules taken. Dissertations are evaluated in September. Successful completion of the MSc programme will result in the award of the degree of MSc in Mathematical Finance (with a possible Merit or Distinction).

Entry requirements
The normal entry requirement for the MSc in Mathematical Finance is the equivalent of a British first or good upper second class honours degree in a subject with a substantial mathematical component: for example, mathematics, statistics, physics, economics, computer science or engineering.

International students, please see the 'international students' section on page 144.

Graduate destinations
This new programme will prepare students for a wide range of careers, especially in the banking and finance sector, as well as marketing, public services, consultancy, industry and commerce.

Further information
Administrative Officer
(Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: maths-pg@maths.qmul.ac.uk

MSc in Applied Statistics

One year full-time, two years part-time
(Subject to approval)

Programme description
The MSc in Applied Statistics aims to provide you with a thorough grounding in important areas of statistics and to prepare you to apply this knowledge to real world problems. This will open up many opportunities for future employment. For example, supporting biological or pharmaceutical research in industry. The programme covers every stage of the process of providing statistical advice to researchers. As well as helping you design experiments and analyse data, you will also learn about the practical aspects of consultation and report presentation.

The programme does not assume any expert statistical background. Statistical theories will be motivated and illustrated by using data or real world examples. The main focus is on the theory and techniques which will be useful for a practising applied statistician in industry or research.

Programme outline
The study programme consists of eight compulsory modules split evenly between two semesters, with one such module typically comprising 24 hours of lectures and 12 hours of tutorials given during a twelve-week semester. During the summer period, supervised by an academic member of staff, you are required to complete a dissertation. You will also be offered a two-week presessional course whose aim is to introduce students without statistical background to the necessary statistical concepts. Areas covered include linear and generalised linear and multilevel models, multivariate statistics, statistical computing and the principles of statistical design of experiments.

Assessment
Examinations are held between May and early June on the modules taken. Dissertations are evaluated in September. Successful completion of the MSc programme will result in the award of the degree of MSc in Applied Statistics (possibly with Merit or with Distinction).

Entry requirements
The normal entry requirement for the MSc in applied statistics is a British first or good upper second class Honours degree in a subject with a strong numerical component: for example, mathematics, statistics, biology, economics, computer science or engineering.

International students, please see the 'international students' section on page 144.

Graduate destinations
This new programme will prepare students for a wide range of careers, especially those which involve processing and analysing data. Possible graduate destinations would include pharmaceutical or government statistician, actuary, operational researcher, financial risk analyst, market researcher, teacher, chartered accountant, insurance risk surveyor, and biometrician.

Further information
Administrative Officer
(Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: maths-pg@maths.qmul.ac.uk

Degree programmes

MSc and Diploma in Astrophysics

One year full-time, two years part-time

Programme description

Recent observational and theoretical advances have led to significant leaps in our understanding of the universe and its constituents. The MSc and Diploma aim to equip students to understand and appreciate astrophysics as a basis for further progress in such current research areas.

These programmes are unique in the UK in the scope of material covered. They offer the opportunity for students with a variety of backgrounds and interests to study a broad range of advanced topics in modern astrophysics. You will have the opportunity to learn about these recent fascinating discoveries, while being taught by researchers in the Astronomy Unit who are leaders in their fields.

For many students who progress to the MSc from their undergraduate degree, the programme provides a useful stepping-stone to research work. Part-time students include teachers and other professionals who wish to upgrade their qualifications, or those who are studying for their own interest.

Programme outline

In both programmes you take eight taught modules. For the details of the modules typically offered (subject to some changes) see: www.astro.qmul.ac.uk/ postgraduate/msc-astrophysics/modules

These programmes also allow some flexibility with the choice of the modules from related disciplines, subject to the agreement of the programme director. For the MSc you are also required to complete a written project on an advanced topic in astrophysics.

Assessment

For the MSc, you are required to satisfy the examiners in modules with a total of 180 credits, 120 of which are for taught modules and 60 for the written dissertation. Diploma students are required to satisfy the examiners in modules with a total of 120 credits, but do not submit a dissertation.

Entry requirements

For the MSc and Diploma a first or upper second class honours degree (or equivalent) is required in physics, applied mathematics or astrophysics/astronomy. The Postgraduate Certificate in Astronomy and Astrophysics may also qualify you for entry on to the MSc.

International students, please see the ‘international students’ section on page 144.

A limited number of scholarships should be available for highly qualified MSc applicants.

Recent graduate destinations

Our graduates have found employment in a wide range of sectors, from business and finance, to teaching and academic research. A high proportion of our graduates go on to take a PhD degree.

Further information

Administrative Officer (Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: astro-pg@qmul.ac.uk

Postgraduate Certificate in Astronomy and Astrophysics

Nine months part-time

Students who do not qualify for admission to the MSc or Diploma in Astrophysics may consider our part-time Postgraduate Certificate in Astronomy and Astrophysics. This programme consists essentially of the first year of the part-time MSc in Astrophysics.

Assessment

For the Postgraduate Certificate you must satisfy the examiners in four modules.

Entry requirements

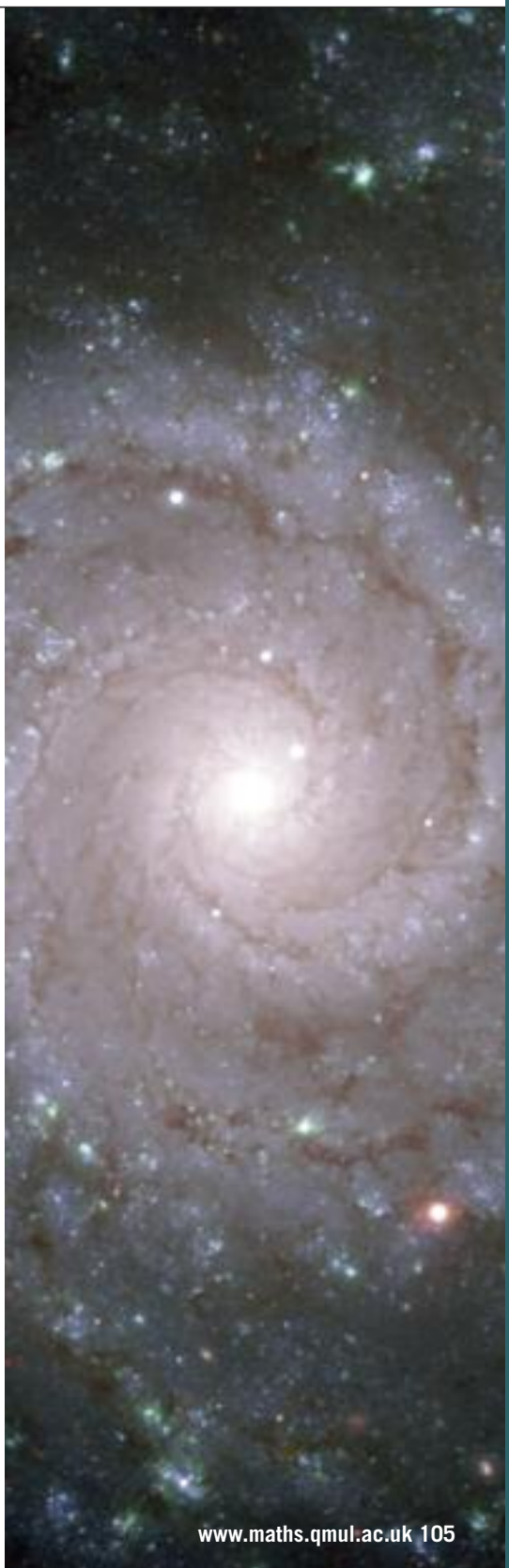
You should have a degree (or equivalent) in a subject with substantial mathematics or physics content. International students, please see the 'international students' section on page 144.

Recent graduate destinations

Students successfully completing the Postgraduate Certificate programme at a sufficiently high level may be allowed to continue to the MSc in Astrophysics as a second year.

Further information

Administrative Officer (Postgraduate Studies and Research)
Tel: +44 (0)20 7882 5454
email: astro-pg@qmul.ac.uk



Research

We welcome postgraduate students and visiting research fellows to undertake research in our areas of interest (see below). Research students are registered for University of London degrees (MPhil/PhD) and work under the supervision of members of academic staff.

Students may receive financial support (research studentships) offered by the research councils (including CASE studentships in collaboration with an industrial sponsor). A limited number of College studentships are also available.

Entry requirements
Candidates for the PhD or MPhil programmes in mathematics or statistics should normally have a first or good upper second-class honours BSc in mathematics or statistics, or a more advanced qualification such as MSci, MMath, or MSc. Candidates for the PhD or MPhil programmes in astronomy should have a first or good upper second-class honours BSc in mathematics, physics or astronomy, or in a subject with substantial mathematics or physics content, or a more advanced qualification such as MSci or MSc.

International students, please see the 'international students' section on page 144.

Research areas

Mathematics Research Centre

Algebra
Research work centres on group theory, especially linear groups and algebraic groups, topological and combinatorial aspects of group theory, finite p-groups, computational group theory, and representation theory.

Analysis
Research work centres on harmonic and functional analysis, especially harmonic analysis on groups, operator algebras, infinite dimensional manifolds and holomorphy.

Combinatorics
A very active group that works both on topics within combinatorics (especially finite geometry and design theory) and on links with algebra (permutation groups), logic (model theory), information and coding theory, and design of experiments.

Number Theory and Topology
There are several overlapping areas of activity within the Mathematics Research Centre, for example topology and number theory are not only researched independently, but they are also used as research tools in group theory and dynamical systems.

Dynamical Systems
Areas of current research interest are: dynamics on discrete phase space, bifurcation theory, complex maps, ergodic theory, control systems, spatio-temporal chaos, applications of chaotic systems to packet traffic, thermodynamic formalism, algebraic dynamics, number theory and functional equations.

Statistical Mechanics
Research interests of this group include generalised statistical mechanics methods applied to a variety of complex systems (hydrodynamic turbulence, econophysics, traffic flow, biological and medical applications). The group uses tools from large deviation theory, nonequilibrium statistical mechanics and the theory of stochastic processes.

Relativity and Computation
The Relativity group is a collaboration between the Mathematics Research Centre and the Astronomy Unit. Research interests include: exact solutions of Einstein's equations and applications of algebraic computing, topological questions, alternative theories of gravity, black holes, and gravitational radiation. Within the Astronomy Unit there is research in cosmology, alternative theories of gravity, and experimental tests.

Probability
The group concentrates on probabilistic problems arising on the interface between probability and physics and probability and combinatorics. The main research topics are random matrix theory, differential and difference equations with random coefficients, in particular, random Schroedinger operators, Lyapunov exponents, Poisson approximations, and random combinatorial objects.

Statistics
The Statistics group works on the design of experiments, on Bayesian statistics, and on sequential analysis. In the design of experiments there is particular emphasis on applications in the pharmaceutical industry, agriculture, the food industry and chemistry, but the underlying algebraic theory and combinatorial structure are also explored.

Staff profile: Professor Peter J Cameron

Professor of Mathematics

"A recent project I was involved with arose out of the theory of automata, but can be described like this. You are in a dungeon consisting of a number of caves; each cave has three doors (red, green and blue), opening into passages going to other caves. There is one further door in each cave; from one cave it leads to freedom, from the others to instant death. You have a map of the dungeon, but don't know where you are. What do you do?

"This question leads to interesting problems about permutation groups, graphs, and many other important areas of mathematics, some of which are at the limit of what we can currently do by computation.

"The best outcome of my research would be a proof of a 40-year-old conjecture called the Cerny conjecture. But even if this doesn't happen, I have been involved with uncovering many important connections in this area.

"Thanks to my own research activities, students get a vivid sense of how unexpected research outcomes can be. For example, one never knows where research is going to lead, and it is very important for students to become aware of unexpected directions and connections.

"The School of Mathematical Sciences is the best place I know for interactions between all areas of the subject. I have collaborations with colleagues in many areas of pure and applied mathematics, probability and statistics."

Staff research interests

Professor David Arrowsmith BSc PhD(Leic)
Professor of Mathematics
Dynamical systems, telecommunications: chaotic dynamical systems, applications to modelling telecommunications networks, control theory

Professor RA Bailey MA DPhil(Oxon)
Professor of Statistics
Statistics, combinatorial design: design of experiments, Latin squares, association schemes

Oscar Bandtlow MPhil PhD(Cantab)
Lecturer in Applied Mathematics
Dynamical systems and functional analysis: applications of operator theory to probabilistic behaviour of chaotic dynamical systems and to statistical mechanics

Professor Christian Beck Diplom PhD(Aachen)
Professor of Applied Mathematics
Dynamical systems: interplay between nonlinear dynamical systems, statistical mechanics and stochastic processes; spatio-temporal chaos

Barbara Bogacka MSc PhD(Poznan)
Reader in Probability and Statistics
Statistics: experimental designs for linear and non-linear models of observations; optimisation of designs for parameter estimation, hypothesis testing, and discriminating between models

Professor Shaun Bullett MA(Cantab) PhD(Warw)
Professor of Mathematics
Dynamical systems, algebraic and geometric topology: dynamics of complex maps, Kleinian groups and holomorphic correspondences, hyperbolic geometry, topology, symbolic dynamics

John Bray BA(Cantab) PhD(Birmingham)
Lecturer in Pure Mathematics
Algebra and Combinatorics: Finite groups, explicit representations and presentations of groups, computational group theory

Professor Peter Cameron BSc(Q/land) DPhil(Oxon)
Professor of Mathematics
Algebra, Combinatorics: Permutation groups, and the (finite or infinite) structures on which they can act (designs, graphs, codes, geometries etc)

Professor Ian Chiswell BA(Oxon) MSc PhD(Mich)
Emeritus Professor
Combinatorial Group Theory: Generalised trees, logic, low-dimensional topology, equations over groups, right-ordered groups, cohomology of groups

Professor Cho-Ho Chu BSc(Hong Kong) PhD(Wales)
Professor of Mathematics
Analysis: Harmonic and functional analysis, Jordan operator algebras, infinite-dimensional manifolds

Steve Coad BSc(CNAA) MSc DPhil(Oxon)
Reader in Statistics
Statistics: Sequential analysis, asymptotic approximations, inference, medical applications, multivariate analysis

Matthew Fayers MA PhD(Cantab)
Lecturer in Mathematics
Algebra: Representation theory of groups and algebras, Hecke algebras, Schur algebras

Professor Ilya Goldsheid DSc(Moscow)
Professor of Probability Theory
Analysis: Asymptotic Behaviour of Products of Random Matrices, Anderson localisation, spectral analysis of random operators, dynamical systems and probability theory

Heiko Grossmann Dipl-Math(Berlin) PhD(Munster)
Lecturer in Statistics
Statistics: design of experiments, optimal design, hierarchical generalised linear models, response surface methodology, discrete choice experiments and applications

Rosemary Harris MPhys DPhil(Oxon)
Lecturer in Applied Mathematics
Stochastic non-equilibrium systems: large deviations, fluctuation theorems, applications (including traffic, econophysics, biological modelling)

Professor Bill Jackson MSc PhD(Waterloo)
Professor of Mathematical Sciences
Combinatorics, algebra: graph theory, matroid theory, motivated by applications in areas from mathematical physics to computer science and operations research

Professor Oliver Jenkinson BSc MSc PhD(Warw)
Professor of Mathematics
Dynamical systems: ergodic theory of chaotic dynamical systems, thermodynamic formalism, ergodic optimisation, continued fractions, algorithms for computing geometric and dynamical invariants

Professor Mark Jerrum MA(Cambridge) PhD(Edinburgh)
Professor of Mathematics
Director of Postgraduate Studies
Combinatorics, computational complexity, stochastic processes: randomised algorithms, Markov processes

Robert Johnson MA PhD(Cantab)
Lecturer in Mathematics
Combinatorics, graph theory: extremal combinatorics, problems at the interface of graphs and set systems

Wolfram Just Diplom PhD(Darmstadt) Habil
Reader in Mathematics
Nonlinear dynamics and statistical mechanics: applications of equilibrium statistics to dynamical systems, pattern formation and phase transitions in dynamical systems; control of chaotic behaviour by time-delayed feedback

Professor Peter Keevash MA(Cantab) PhD(Cantab) PhD(Princeton)
Professor in Mathematics
Extremal combinatorics, graph theory, hypergraphs and set systems, algebraic and probabilistic methods in combinatorics, random structures, combinatorial optimisation, combinatorial geometry, combinatorial number theory

Professor Boris Khoruzhenko PhD(Kharkov)
Deputy Head of School
Professor of Mathematics
Random matrices and operators: statistical properties of eigenvalues of non-Hermitian random matrices

Rainer Klages Diplom PhD(Berlin) Habilitation(Dresden)
Lecturer in Applied Mathematics
Dynamical systems: applications of dynamical systems theory to nonequilibrium statistical mechanics, chaotic and fractal properties of transport, anomalous transport, diffusion in nanopores, the modelling of biological cell migration

Professor Charles Leedham-Green MA DPhil(Oxon)
Emeritus Professor
Algebra, computational group theory: the 'matrix group recognition project', p-groups and pro-p-groups

Professor Shahn Majid MA(Cantab) PhD(Harvard)
Professor of Mathematics
Quantum groups: noncommutative differential geometry, quantum groups, Hopf algebras, representation theory, knot theory, noncommutative geometry of discrete systems

Professor Angus Macintyre FRS
Professor in Mathematics
Model theory, mathematical logic, group theory, algebraic geometry, number theory and neural methods

Hugo Maruri-Aguilar PhD(Warwick)
Lecturer in Statistics
Statistics: design of experiments, optimal design, computer experiments, space filling designs, algebraic statistics

Professor Thomas Müller MSc PhD(Frankfurt am Main) Habil
Professor of Mathematics
Group theory, combinatorics: subgroup counting functions and their properties

Lawrence Pettit BA(Oxon) MSc(Lond) PhD(Nott) CStat
Reader in Statistics
Statistics: bayesian statistics, outliers and diagnostics for model choice, degradation models, inference for stochastic processes

Professor Donald Preece MA(St Andrews) PhD(Kent)
Emeritus Professor
Design of experiments, combinatorics: non-orthogonal Graeco-Latin designs, neighbour designs and tight single-change covering designs

Thomas Prellberg MSc MSc PhD(Virginia Tech) Dr Habil(Clausthal)
Reader in Applied Mathematics
Statistical mechanics and dynamical systems: Exactly solvable combinatorial models of statistical mechanics, application of statistical mechanics in dynamical systems analysis, development of approximate counting algorithms for statistical mechanics models

Professor Leonard Soicher BSc MCompSci(Concordia) PhD(Cantab)
Professor of Mathematics
Computational group theory and geometry: applications of computation to the investigation

of groups and combinatorial structures, the GAP computer system for group theory and discrete mathematics

Dudley Stark BSc(Rochester) PhD(USC)
Reader in Mathematics and Probability
Probability and statistics: probabilistic combinatorics, the study of randomly chosen combinatorial structures

Ivan Tomasic PhD(Edinburgh)
Lecturer in Pure Mathematics
Model theory, algebraic geometry, number theory: arithmetic aspects of the frobenius automorphism, geometry of fields with measure, (nonstandard) cohomology theories, motivic integration

Hugo Touchette BSc(Sherbrooke) MSc(MIT) PhD(McGill)
Lecturer in Applied Mathematics
Dynamical systems and statistical mechanics: Applications of the theory of large deviations, the control of stochastic systems, applications of information theory in control

Professor Franco Vivaldi Laurea in Fisica (Milan)
Professor of Applied Mathematics
Algebraic dynamical systems: arithmetical phenomena underlying strongly chaotic motions, applications to the study of round-off errors in computer representations of dynamical systems

Mark Walters PhD(Cantab)
Lecturer in Pure Mathematics
Combinatorics and probability: The border between combinatorics and probability with particular reference to percolation and random methods in combinatorics

Professor Robert Wilson MA PhD(Cantab)
Professor of Pure Mathematics
Group theory, representation theory: computational techniques for calculating in large groups, including the Monster group

Francis Wright MA(Cantab) PhD(Bris)
Director of Undergraduate Studies
Reader in Mathematics
Computer algebra, computation: algebraic and symbolic computation, symbolic/numeric solution of problems in the optimum design of experiments, exact symbolic solution of differential equations, interactive mathematics via the web

Astronomy Unit

Cosmology
The aim of cosmology is to unravel the mysteries of the universe as a whole. It addresses such fundamental questions as: why does the universe have its observed structure; how did it develop into its current form; what will happen to it in the future? Specific interests include the origin of the universe, inflationary and superstring cosmology, primordial black holes, the cosmic microwave background, inhomogeneous cosmology, the formation and evolution of large-scale structure, dark matter and gravitational lensing.

Gravitation
Work within the group covers theory, data analysis and experiments. Research areas include space experiments on gravitation, gravitational waves, theories of gravity and tests, relativistic astrophysics, black holes.

Planetary Formation, Astrophysical Fluids, and Accretion Discs
A primary research area is the formation and evolution of planets and planetary systems, especially their interaction with protoplanetary discs. Simulations employing state-of-the-art hydrodynamic, MHD and N-body codes on parallel supercomputers are used to study topical problems in planetary formation and accretion disc theory. Simulations are also employed to study the dynamics and evolution of planetary atmospheres, especially those of terrestrial planets and short-period extrasolar giant planets ('hot Jupiters').

Staff profile: Richard Nelson

Professor of Mathematics and Astronomy

"My main research is in the area of planet formation theory. The first planet orbiting a star outside of the solar system was discovered in 1995, and since this time over 300 extrasolar planetary systems have been discovered. Many of these systems are very different from the solar system, which raises questions about how they have formed and evolved. My research uses large-scale computer simulations to model the formation of these planetary systems, including many physical effects such as orbital migration due to interaction with the protoplanetary disc, and MHD turbulence within the discs.

"I was working on the dynamics of discs surrounding young stars when the first extrasolar planet was discovered in 1995. The question of how planetary systems form is now one of the hottest topics in astrophysics.

"Ultimately, we want to be able to compare the predictions of our theoretical models with observations of planetary systems. The best possible outcome would be good agreement between the models and observations, showing that we really do understand planet formation.

"My research provides many ideas for MSc and PhD projects, and having a supervisor who is actively pursuing research gives students confidence that their projects are on interesting topics of relevance to the broader scientific community.

"The study and working environment at Queen Mary is fantastic because it combines a relaxed and informal atmosphere with the highest levels of academic rigour. In my opinion this makes it a great place to undertake postgraduate study."

Solar and Stellar Physics

The work of the group covers many areas. Stellar physics constrains the ages of different stellar components and hence the evolution the Galaxy itself. Stars are used to calibrate age and distance measurements on the largest cosmological scales. They are the sources of most of the chemical evolution in the universe, elements being created and destroyed by nuclear burning and subsequently ejected into the interstellar medium. They are laboratories to study astrophysical processes such as convection, nucleosynthesis, mass loss and accretion, rotation and magnetic fields. The sun is uniquely valuable because we can study it close up, observing many phenomena that cannot be resolved in more distant stars.

Solar System Bodies and Dynamics

Work covers theory, data analysis, observations and simulations. Research areas include: physical studies of asteroids, comets and Kuiper Belt objects; long-term dynamics and orbital stability of meteoroids, asteroids, comets, natural satellites and planets; chaos in the solar system; resonance passage and tidal evolution; astrometric observations of planetary satellites; Voyager image analysis; planetary ring dynamics; computer algebra in celestial mechanics. The group is also involved in the highly successful NASA/ESA Cassini mission to Saturn and ESA's Rosetta mission.

Space and Solar Plasma Physics

Research areas cover: the structure of collisionless shocks, including the Earth's bow shock and interplanetary shocks; particle acceleration; kinetic waves and associated features; plasma turbulence. Theoretical work includes numerical self-consistent particle simulations and kinetic wave theory. Research areas cover: the structure of collisionless shocks, including the Earth's bow shock and interplanetary shocks; particle acceleration; kinetic waves and associated features; plasma turbulence. Theoretical work includes numerical self-consistent particle simulations and kinetic wave theory. Solar coronal heating

problem; various wave modes in inhomogeneous space plasmas and magnetic reconnection; solar flares; large scale numerical simulations (Vlasov, Particle-in-Cell and Magnetohydrodynamic); theoretical modeling of radio emission from solar flare electrons (Type III solar radio bursts).

Survey Astronomy

Surveys involve both statistical studies of large numbers of objects for astrophysical studies, and samples of rare objects whose properties can be studied in greater detail. They are relevant to the solar system, stars, the interstellar medium, the structure and evolution of our own and other galaxies, large-scale cosmological structure, dark matter and dark energy. Our research programmes use multi-wavelength wide-field imaging surveys at infrared and optical wavelengths. There is a strong involvement in VISTA and various spectroscopic surveys.

Staff research interests

Craig Agnor BSc(Denison) PhD(Colorado)
Lecturer in Astronomy
Solar system origins, celestial dynamics, giant impacts: The origin and evolution of planetary and satellite systems, dynamical studies of planetary accumulation and orbital migration, numerical models of giant impacts between planets

Professor David Burgess BA(Oxon) PhD(Lond)
Professor of Mathematics and Astronomy
Space plasma physics and computational astrophysics: connections between the Sun, the Earth's magnetosphere and the interstellar medium, computational models of the solar wind, development of parallel simulations using large clusters of computers

Professor Bernard Carr BA PhD(Cantab) FRAS
Professor of Mathematics and Astronomy
Cosmology and relativistic astrophysics: the early universe, primordial black holes, Population III stars, dark matter, cosmological solutions of Einstein's equations and the anthropic principle

James Cho BS MS MPhil PhD(Columbia)
Reader in Astrophysics and Planetary Science
Astrophysics and planetary science, fluids, applied mathematics: mechanisms that transport momentum, heat, and tracers in or on planets and discs, the atmospheric dynamics and climate of solar and extrasolar system planets

J Richard Donnison BSc(Surrey) MSc(Lond) PhD(Lond) FRAS
Senior Lecturer in Astronomy
Dynamics and planetary sciences: dynamics of N-body systems related to the orbits of planets, asteroids, trans-Neptunian bodies and comets, statistics of various distributions of bodies in the solar system

Professor Jim Emerson MA(Cantab) PhD(Lond) MInstP CPhys FRAS
Professor of Astrophysics
Survey astronomy: infrared surveys for exploration of galactic structure and its evolution, large scale structure, brown dwarfs and high red shift quasars, dark energy/matter studies. Leader of VISTA telescope project at ESO in Chile

Professor James Lidsey BSc(Birmingham) PhD(Lond)
Professor of Mathematics and Astronomy
Cosmology and the early universe: the inflationary scenario, primordial gravitational waves, primordial black holes, higher dimensional theories, the formation of large scale structure in the universe, superstrings and M-theory

Karim Malik BSc(Sussex) Dipl.-Ing.(Stuttgart) PhD(Portsmouth)
Lecturer in Astronomy
Cosmology and perturbation theory: physics of the early universe, perturbation theory and its applications to cosmology, inflation and non-gaussianity, primordial black holes, brane world models

Professor Carl Murray BSc PhD(Lond) FRAS
Professor of Mathematics and Astronomy
Solar system: dynamics of the solar system, from the motion of cosmic dust particles to the stability of planetary rings, member of the Imaging Team on the Cassini mission to Saturn

Professor Richard Nelson BSc PhD(Lond)
Professor of Mathematics and Astronomy
Planet formation, accretion discs, astrophysical fluid dynamics, computational astrophysics: formation and evolution of extrasolar planetary systems, the structure and evolution of accretion discs, star formation, the dynamical evolution of molecular clouds, and computational astrophysics

Alexander Polnarev DSc(Moscow) FRAS
Senior Lecturer in Astronomy
Early universe, quasars, AGN, gravitational waves and experiments: detection of polarisation of the cosmic microwave background radiation (CMBR), gravitational wave detection, supermassive binary black holes

Professor Ian Roxburgh BSc(Nott) PhD(Cantab) FRAS
Research Professor
Astrophysical fluids, solar and stellar physics, theoretical and experimental gravity: Structure and evolution of the sun and stars, the internal structure, dynamics, and state-of-evolution of stars, multi-mode oscillations of stars, theories of gravity, and experimental tests

William Sutherland MA PhD(Cantab)
Senior Lecturer in Astronomy
Observational cosmology and survey astronomy: large-scale structure and galaxy surveys, Project Scientist for VISTA telescope and Principal Investigator for VIKING (VISTA Kilo-degree Infrared Galaxy survey)

Professor Reza Tavakol BSc PhD(Lond) FRAS
Professor of Mathematics and Astronomy
Cosmology, nonlinear stellar dynamos, early universe and cosmological aspects of superstrings and M-theory, nonlinear dynamics

David Tsiklauri MSc(Tbilisi) PhD(Cape Town) FRAS
Senior Lecturer in Astronomy
Solar coronal heating problem; wave modes in inhomogeneous space plasmas and magnetic reconnection; solar flares; large scale numerical simulations (Vlasov, Particle-in-Cell and Magnetohydrodynamic); theoretical modeling of radio emission from solar flare electrons (Type III solar radio bursts)

Professor Iwan Williams BSc(Wales) PhD(Lond) FRAS FInstP
Emeritus Professor
Physical properties of asteroids, comets and meteorites: dynamics and physical properties of asteroids, comets and meteoroids, and inter-relationships between all the minor bodies of the Solar System

Sergei Vorontsov DSc(Moscow)
Senior Research Fellow in Astronomy
Astrophysical fluids, solar physics, helioseismology: investigation of the internal structure and internal dynamics of the sun by means of solar seismology, development of theoretical tools of asteroseismology to study the internal structure of the distant stars

Giammarco Campanella, Research on Exoplanets

"I am working on the detectability of the moons of extrasolar planets, so-called exomoons as well as working on light curve data analysis, exoplanet InfraRed observations and dynamics of planetary systems.

"I wanted to continue working on exoplanets and Queen Mary was one of the few top-rated UK universities offering PhD positions in this field. Moreover, I had a profitable experience when I was an Erasmus student at Queen Mary a couple of years ago, which made me keen to return.

"The Students' Union organises a wide range of social events which makes it easy to make new friends. There's also a state-of-the-art gym and fitness centre, alongside the newly refurbished Drapers' bar on campus. Furthermore, Queen Mary offers all the benefits of living in the vibrant city of London with the West End reachable in just 15 minutes.

"I really enjoy the chance that a PhD gives you of travelling in order to attend national and international conferences. Conferences offer a fantastic opportunity to have new experiences, gain knowledge and show your work to the scientific community."

Statistics

The cross-faculty Centre for Statistics brings together all statisticians at Queen Mary. The Centre runs high-profile events, as well as keeping members informed of statistical activities throughout the College. Queen Mary has an international reputation for research in the design of experiments, medical statistics, econometrics and Bayesian statistics. With approximately 25 academic staff, the Centre is one of the largest groups of statisticians in the UK.

Research strengths

Created in 2005, the cross-faculty Centre for Statistics highlights the importance of Statistics at the College, with research taking place in several schools and across all three faculties, Science and Engineering, Medicine and Dentistry and Humanities and Social Sciences. As a PhD student working on a statistical project in any school of the College you will automatically become a member of the Centre for Statistics, and will be encouraged to take part in its activities.

Queen Mary has an international reputation for research in statistical methodology, medical statistics, econometrics and other areas of applied statistics. The design of experiments group is internationally known as being a unique centre of excellence in the theory and application of planning experiments and analysing the resulting data. This is closely related to research in clinical trials, which is a major strength of the medical statistics group, along with epidemiological methods. Econometric time series methods form an important part of research in economics. The Centre is also well-known for its work in Bayesian statistics, covering both methodology and decision support software.

Postgraduate resources

As a research student you will be admitted to, and based in, one of the schools of the College, although you might have a second supervisor in a different school. For information on facilities, see the appropriate school entry. The main Library at Mile End has an extensive collection of books on statistical theory, methods and applications and a broad collection of journals on statistics and econometrics, while the medical library has a further collection of books and journals related to medical statistics. You also have wider access to other libraries in London.

You will take some courses in your first year of study and statisticians from Queen Mary played a leading role in the development of the London Taught Course Centre (LTCC) for research students in mathematical sciences. This brings together students from all over London for courses aimed specifically at PhD students in statistics and will help you to gain an internationally leading breadth of knowledge in the subject, as well as becoming part of the London-wide research community.

Scholarships/studentships

Studentships are available from various sources and change from year to year. In 2009, we had one EPSRC studentship and two College studentships earmarked specifically for statistics, but several other studentships were also open to those doing statistical projects. Studentships are allocated by the relevant school, who should be contacted for specific details. For general information, however, see www.stats.qmul.ac.uk or contact maths-pg@qmul.ac.uk

If you are interested in applying for support you should contact the Postgraduate Admissions Officer (Postgraduate Studies and Research) in the School of Mathematical Sciences by emailing maths-pg@qmul.ac.uk

Research quality indicators

The Research Assessment Exercise
Statisticians at Queen Mary were assessed under at least seven different units of assessment in the 2008 Research Assessment Exercise, across several different schools at Queen Mary. This reflects the great importance of statistics activity across Queen Mary's research profile. You can find the results in each school's section of this prospectus.

Projects, funding, research grants and awards
The design of experiments group is currently running projects on several topics, in collaboration with biologists, electronic engineers and materials scientists. Three statisticians from Queen Mary will run a workshop at the prestigious Isaac Newton Institute for the Mathematical Sciences in the second half of 2011.

The medical statistics group have several ongoing projects, including a high-profile study on antenatal screening. This involves working directly with pregnant women to develop improved screening protocols for conditions such as Down's syndrome and neural tube defects.

The Bayesian statistics group attracts large amounts of funding from research councils and industry. For example, an ongoing project funded by EPSRC and Motorola aims to produce decision support programs for component based software testing.

Further information

For enquires about the Centre for Statistics
School of Mathematical Sciences
Queen Mary, University of London
Mile End Road
London
E1 4NS
Tel: +44 (0)20 7882 7833
email: maths-pg@qmul.ac.uk.

Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

For study in medical statistics, applications should be sent to
School of Medicine and Dentistry
The Admissions and Recruitment Office
Room CB02
Queens' Building
Mile End
E1 4NS
Tel: +44 (0)20 7882 5533
email: pgsmd@qmul.ac.uk

For study in econometrics or quantitative geography, applications should be sent to
Faculty of Humanities and Social Sciences
Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel:+44 (0)20 7882 5533
email: admissions@qmul.ac.uk

For study in statistical methodology, or decision support systems, applications should be sent to
Faculty of Science and Engineering
Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teamb@qmul.ac.uk

Careers

Statistics is ubiquitous in the working world, so highly qualified statisticians are in great demand in industry, the public sector and charities. Many research students in statistics work on projects in collaboration with, or directly motivated by, industry or research organisations. The value of a PhD qualification as an indication of transferable skills, as well as statistical expertise, is being increasingly recognised in industry.

Current research students are working in collaboration with Pfizer Global Research and Development, on Bayesian design and analysis of industrial experiments, and with Cancer Research UK, on analysis of multi-arm clinical trials, as well as with academic researchers in other disciplines, including biological sciences, on spatial population genetics.

Recent PhD graduates have gone on to work in academia, research organisations and industry, including as a medical statistician at the University of Warwick, an epidemiologist at the Medical Research Council and a software engineer at BT.

Graduate profile: Sandra Eldridge

Studied: PhD Statistics

Currently: Professor of Biostatistics at Queen Mary, University of London

Why did you choose Queen Mary for your postgraduate study? I was already working at the College, and the idea for my PhD was developed in collaboration with senior colleagues who were then the ideal supervisors.

What did you gain from your time at Queen Mary? A better understanding of research and research management, an in depth knowledge of statistics in one particular area at the same time as continuing with collaborative multidisciplinary health services research.

What are your career plans in the next five years? To continue to work in health services research developing methodology particularly relevant to trials in primary health care and complex interventions in healthcare.

Degree programmes

MSc in Finance and Econometrics

One year full-time, two years part-time

Programme description

The MSc in Finance and Econometrics provides graduate students and professionals with a rigorous training and strong analytical background in finance, financial economics and econometrics.

This intensive programme covers all the analytical tools and the advanced materials in quantitative asset pricing, econometrics, financial derivatives, financial econometrics. You will also cover areas of specialisation such as asset pricing and modelling, international finance, time series analysis and corporate finance. This programme has a research dissertation component and is recognised as a Research Training degree by the ESRC under their "1+3" scheme.

The programme is designed for students and professionals who aim to pursue careers as financial economists and quantitative analysts in the private sector, in the government or in international financial institutions. The programme is also suitable preparation for an academic career.

Programme outline

Pre-sessional modules

Mathematics • Statistics

Core modules

Investments • Econometrics B • Econometrics A • Financial Econometrics • Time Series Analysis

Module options include:

Macroeconomics A • Microeconomics A • Macroeconomics B • Microeconomics B • Corporate Finance • Financial Derivatives • Labour Economics • International Finance • Mathematics for Economists • Advanced Asset Pricing and Modelling • Empirical Macroeconomics • Topics in Macro-Labour • Econometrics C

Assessment
The grade for each module is assessed through coursework, which counts for 25 per cent of the final marks, along with a written exam in May. The 10,000 word dissertation written over the summer counts for four modules.

Entry requirements
You should have at least an upper second class honours degree, or equivalent, in economics or a related subject. A good basic knowledge of relevant statistical theory and mathematics is also necessary, and students are required to sit pre-sessional statistics and mathematics examinations following an intensive two-week course in September. International students please see the 'international students' section on page 144.

Further information
Postgraduate/Research Programme Manager
Sandra Adams
Tel: +44 (0)20 7882 7356
email: econ-postgrad@qmul.ac.uk

For informal enquiries, please contact:
Dr Andrea Carriero
Tel: +44 (0)20 7882 8050
email: a.carriero@qmul.ac.uk

MSc in Applied Statistics

One year full-time, two years part-time (Subject to approval)

For more information, please see page 103 (Mathematical Sciences section).

Wai Yin Winnie Yeung, PhD in Statistics

"I am currently studying the biased coin design which is a design for sequential patient allocation to different treatments in a clinical trial.

"I am working on the power of this design and comparing the power of other different designs in patient allocation, producing numerical results and mathematical expressions for the powers.

"I chose to study at Queen Mary because of the high quality of teaching in the School and the great support I received from lecturers and tutors while I was studying here for my bachelors in Mathematics and Statistics.

"The best thing about the programme is the diversity of modules that you can choose from. As a member of the University of London, I can also attend courses at other colleges. The Learning Institute courses in Queen Mary are also helpful, covering writing skills, presentation skills and communications skills.

"My favourite place on campus is the Library. It's a great place to concentrate and work efficiently. I have always been able to find the books or journals I need. There are also massive numbers of computers, all with internet access. Overall I would rate Queen Mary ten out of ten."

Research

We welcome postgraduate students and visiting research fellows who wish to undertake research in our areas of interest (see below). You will be registered for a University of London degree (MPhil/PhD) and work under the supervision of members of academic staff.

You may receive financial support (research studentships) offered by the research councils (including CASE studentships in collaboration with an industrial sponsor). A limited number of College studentships are also available.

Entry requirements
Students with upper second class (or better) BSc honours degrees or equivalent are eligible to apply for admission to research degrees.

International students, please see the 'International students' section on page 144.

Research areas

Research interests can be broadly grouped into five overlapping areas:

Bayesian Statistics

The Bayesian approach to statistics has long been considered theoretically sound and has more recently made great inroads into practice. Current interests include systems risk and software project risk assessment, operational risk in finance, decision analysis with Bayesian networks, outliers and diagnostics for model choice, degradation models and inference for stochastic processes, with applications in medicine and engineering.

Design of Experiments

Planning investigations so that they will produce useful data is at least as important as analysing the data which are collected. Research interests in this area include: experiments with multiple phases (eg a field phase followed by a laboratory phase), dose-escalation designs in clinical trials, experiments in genomics and proteomics, industrial experiments with hard-to-set factors, design of measurement schedules for communication networks, experiments in enzyme kinetics and pharmacokinetics, discrete choice experiments in market research, design for generalised linear mixed models and computer experiments.

Econometrics and Time Series

The science of economics is based largely on data collected on economic phenomena over time and research in time series methodology continues to deal with the larger and more complex data sets which have become common in practice. Interests at Queen Mary include the econometric analysis of present value models, theory and application of nonparametric methods to high frequency financial data, parametric and semiparametric estimation for weakly and strongly dependent time series models, ARCH type models, econometrics of auctions, adaptive nonparametric specification testing, nonlinear stationary processes and estimation of dynamic panel data models.

Medical Statistics

The medical field continues to be a source of challenging statistical problems, as well as a major area of application of statistical methods. Particular interests at Queen Mary include cancer prevention and screening, design and analysis of cluster randomised trials, the assessment and communication of risk-benefit of medicines, systematic reviews of evidence, spatial epidemiology, regional demography, epidemiology of dense, high-risk breast patterns, evaluating the effectiveness of prenatal screening strategies and the prevention of cervical cancer in both the developed and the developing world.

Statistical Inference

Frequentist and likelihood-based inference continues to require development in response to the ever more-complex studies being carried out in applications. Current areas of interest include sequential analysis, asymptotic approximations, inference, medical applications and multivariate analysis.

Research areas

Staff research interests

Bayesian Statistics

Professor Martin Neil BSc(Glasgow Caledonian) PhD(South Bank and Strathclyde) MIEEE CEng
Professor of Computer Science and Statistics
Systems risk and software project risk assessment, operational risk in finance, decision analysis with Bayesian networks

Lawrence Pettit BA(Oxon) MSc(Lond) PhD(Nott) CStat
Reader in Statistics
Theory and applications of Bayesian statistics, outliers

Design of Experiments

Professor RA Bailey MA DPhil(Oxon)
Professor of Statistics
Design of experiments with complex unit structures, randomization, Latin squares

Barbara Bogacka MSc PhD(Poznan)
Reader in Statistics
Optimal experimental designs for linear and nonlinear models of observations

Heiko Grossmann BSc MSc(Berlin) PhD(Munster)
Lecturer in Statistics
Design of experiments, including discrete choice experiments and response surface designs

Hugo Maruri-Aguilar BSc(ITQ) MSc(UIA,UGTO) PhD(Warwick)
Lecturer in Statistics
Design of experiments, algebraic statistics, space-filling designs

Econometrics and Time Series

Andrea Carriero PhD(Bocconi University, Milan)
Lecturer
Applied macroeconometrics, forecasting

Francesca Cornaglia PhD(Torino)
Lecturer
Labour economics, applied micro-econometrics, health economics

Professor Marcelo Fernandes BSc MSc(Rio de Janeiro) PhD(Solvag, Brussels)
Professor of Economics
Econometric theory, financial econometrics, empirical finance

Ana Beatriz Galvao PhD(Warwick)
Senior Lecturer
Applied econometrics, forecasting, empirical macroeconomics

Professor Liudas Giraitis PhD(Vilnius)
Professor of Economics
Parametric and semiparametric estimation for weakly and strongly dependent time series models, long memory, ARCH type models

Professor Emmanuel Guerre PhD(Université Paris 6)
Professor of Economics
Econometrics of auctions, adaptive nonparametric specification testing, time seres

Professor George Kapetanios BSc MSc(Lond) PhD(Cantab)
Professor of Economics
Econometrics and macroeconomics

Marika Karanassou BSc(Asoee, Athens) MScEcon PhD(Lond)
Reader in Economics
Natural rate of unemployment, adjustment dynamics, the inflation-unemployment trade-off

Stepana Lazarova Dipl Eng(Prague) MSc(Lond) PhD(Prague)
Lecturer of Economics
Time series econometrics

Marco Mariotti PhD(Cambridge)
Professor of Economics
Game theory, decision theory, axiomatic collective choice

Duo Qin MA DPhil(Oxon)
Senior Lecturer in Economics
Econometrics (history and methodology), applied macroeconomics, development economics, finance

Guglielmo Volpe PhD(Dundee)
Senior Lecturer
Spreadsheets and data in economics, statistical methods in economics

Medical Statistics

Professor Peter Congdon BSc MSc PhD(Lond)
Research Professor of Quantitative Health Geography
Quantitative and modelling applications and has wide experience of research in spatial epidemiology, health service research, regional demography

Professor Jack Cuzick BSc(Claremont, California) MSc(Lond) PhD(Claremont, California)
John Snow Professor of Epidemiology, Head of Cancer Research UK Centre for Epidemiology, Mathematics and Statistics
Cancer prevention and screening with special attention to breast, cervix, colon and prostate cancer, statistical methodology

Professor Stephen W Duffy BSc(Edin) MSc(Lond) CStat
Professor of Cancer Screening
Cancer screening evaluation, markers of cancer risk and prognosis, epidemiology of dense, high-risk breast patterns

Professor Sandra Eldridge BA(Oxon) MSc PhD(Lond)
Professor of Biostatistics
Cluster randomised trials, modelling complex interventions, statistics in primary care

Professor Joan Morris BA MA(Cantab) MSc(Oxon) PhD(Lond) CStat
Professor of Medical Statistics
Deputy Director of the Centre for Statistics
Evaluating the effectiveness of prenatal screening strategies for different disorders, for example cystic fibrosis, fragile X syndrome, neural tube defects and Down's syndrome

Professor Peter Sasieni BA MA(Cantab) MS PhD(University of Washington)
Professor of Biostatistics and Cancer Epidemiology
Cancer screening and the prevention of cervical cancer in both the developed and the developing world

Statistical Inference

Steve Coad BSc(CNAA) MSc DPhil(Oxon)
Reader in Statistics
Sequential analysis, asymptotic approximations, medical applications and multivariate analysis

Physics and Astronomy

The School of Physics and Astronomy has an international reputation for its research, across a range of areas such as experimental particle physics, nanotechnology, organic electronics, superstrings and M-theory. The School's 25 academic staff take pride in providing a first-class education for students, as well as taking part in groundbreaking research, creating a stimulating and supportive study environment. The School is currently expanding, with five new academic staff positions made available in the coming year. We currently take around 20 new PhD students each year.

Research strengths

Early studies in radioactivity were made at Queen Mary by Marsden in collaboration with Rutherford, research which eventually led to Rutherford's discovery of the atomic nucleus. In the 1970s and 1980s, the School was involved in the Nobel Prize winning discovery of the W and Z elementary particles and in pioneering work developing Superstring Theory.

Current research is conducted in dedicated research centres:

- Particle Physics Research Centre (PPRC)
  The PPRC conducts fundamental research in experimental particle physics at the Large Hadron Collider, T2K, SNO+ and SuperB.
- Centre for Research in String Theory (CRST)
  The CRST focuses on string theory and its many applications in physics and mathematics, working on areas such as M

theory, branes and their dynamics, twistor string-gauge theory, emergent D-branes and new geometries in string theory.

- Centre for Condensed Matter and Materials Physics (CCMMP) This new Centre was launched in May 2011 by Professor Martin Dove. Key themes include organic conductors, structure-property relations, and disordered and nanoscale materals.
- Astronomy Unit (AU) The Astronomy Unit, conducts fundamental research into cosmology, formation and dynamics of planetary systems, solar and stellar physics, astronomical and solar plasmas and survey astronomy. The Astronomy Unit will be merging with Physics in a new School of Physics and Astronomy in 2011/12.

The School is also part of the South East Physics Network (SEPnet) which encourages collaboration between universities in the south of England. The School also regularly hosts national and international meetings. PhD students are integral members of their research groups and present their work at international conferences. Many leading academic visitors spend time working with these groups, frequently funded by the various research councils. In addition, between four and seven permanent academic staff normally hold personal fellowships at any one time. Staff lead and participate in international collaborations.

More about the research taking place in the School of Physics and Astronomy can be found on page 132 to 137.

Postgraduate resources

Our groundbreaking research is supported by an extensive infrastructure. You will be able to use excellent IT equipment to do your research. Comprehensive computing facilities are connected by a fast LAN to central College computers and from there to JANET and other WANs. Modern clean rooms are provided for molecular electronics and particle physics detector development. Research groups have a

Research quality indicators

The Research Assessment Exercise
Our School has an international reputation for excellence. In the Research Assessment Exercise 2008, we achieved an average of 2.50 in research outputs, (close to the leading score of 2.90).

Projects, funding, research grants and awards
Much of the research undertaken in the School is funded by the Science and Technology Facilities Council (STFC) and the Engineering and Physical Sciences Research Council (EPSRC). Additional resources and funding are provided via the Organisation Européenne pour la Recherche Nucléaire (CERN), as well as the Royal Society, the Leverhulme Trust, the European Commission, industry, and the Government. The School has been very successful in attracting large grants, recently £29m for SEPnet, £2.7m for PPRC, £1.4m for CRST, and £1m for CMP.

range of lithographic facilities, including e-beam for nano-lithography, various atomic force microscopes and extensive organic-film deposition equipment. There are also laboratories for optical spectroscopy including tunable nanosecond-pulsed lasers, and various materials and semiconductor characterisation equipment.

Scholarships/studentships

The School is offering up to ten three-to-four year PhD studentships, including fees and a maintenance grant of £15,490 per year. The positions are available in the areas of experimental particle physics, string theory and condensed matter physics.

The School has access to further studentships through the SEPnet collaboration with six physics departments in the South East of England, international governmental agreements, as well as an EPSRC Doctoral Training Centre in Plastic Electronics in collaboration with Imperial College. We also offer a number of four-year teaching studentships that cover fees as well as a standard research council-level London-weighted living stipend.

Further information

Dr Alan Drew, Tel: +44 (0)20 7882 7891
email: a.j.drew@qmul.ac.uk

General postgraduate information
Tel: +44 (0)20 7882 7952/7840
email: askthegradteam@qmul.ac.uk

International students
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk

Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teamb@qmul.ac.uk

Careers

A Masters or PhD opens up many career opportunities. A significant proportion of our graduates choose to continue to further research and a career in academia or in industry. Postdoctoral salaries start from £25,000-£30,000 in the UK.

Those choosing careers outside universities find that the skills gained during a PhD or MSc are much valued by employers in a number of sectors. These skills include: a practical and adaptable approach to problem solving, the ability to reason and communicate complex ideas, IT and programming skills, broad intellectual and analytical skills, experience of working with others, and reporting and presentation skills.

As one example, analytical and problem solving skills are vital to the business and finance sector. Starting salaries for actuarial positions in London start from around £23,000, management consultants can expect to earn upwards of £27,000, and specialised workers such as quantitative analysts in banks earn significantly more.

Our graduates find work in a number of sectors including engineering, finance, management consultancy, medical physics, patent examining, renewable energy, science journalism, software engineering and teaching.

You will also be able to consult the careers service as well as members of staff in the School of Physics and Astronomy to get specific careers advice.

Graduate profile: Mark Frogley

Studied: BSc and PhD Physics

Currently: Beamline Scientist at Diamond Light Source

Why did you choose Queen Mary for your postgraduate study?
When I was choosing a university for my BSc, I was looking for a good course and I wanted to live in London. When I decided I wanted to do research, I knew Queen Mary has great facilities and a good reputation. The academic staff were friendly and made time to discuss the science.

What did you gain from your time at Queen Mary?
I feel I got a good degree, and then my PhD, and I developed the ambition to become a professional scientist. I also made good friends and gained a bigger view of the world.

What are your career plans in the next five years?
I hope to establish myself as a beamline scientist and then progress to principal scientist either at Diamond or at another large facility.

Degree programmes

MSc in Physics (EuroMasters)

Two years full-time

Programme description

The aim of the programme is to deepen your understanding of a chosen branch of contemporary physics or astrophysics, covering advanced concepts and techniques, leaving you well prepared for further doctoral level study and research. The programme will also enable you to develop skills transferable to a wide range of other careers. The MSc in Physics is designed to provide a postgraduate award, with 120 ECTS credits, which will allow you to enter doctoral level programmes in other European countries.

You will cover advanced concepts and techniques in either astrophysics or an area of physics. The combination of advanced taught programmes and an extended research training project will allow you to gain a deep understanding of your chosen area of physics or astrophysics. The MSc in Physics is an initiative of the South East Physics Network (SEPnet). The consortium institutions each offer programmes, which are mutually compatible. This allows you to have the possibility of transferring to a partner institution for the second year (for more information see www.sepnet.ac.uk/.

Programme outline

Year 1: Either eight modules from the Intercollegiate MSci fourth year or eight taught modules of the MSc Astrophysics (please see pages 104-105)

Year 2: Advanced Research Methods (30 credits) and an extended research-training project, including appropriate taught material and training, and the production of a dissertation.

Assessment
Assessment will be by examination, some modules also have a coursework component. The research-training project is assessed by written dissertation. Lab work may be required for some modules and/or projects.

Entry requirements
Entry to the programme requires a minimum of an upper second honours degree at bachelors level in physics, or its equivalent. Direct entry to the second year of the programme requires students to have achieved the equivalent of a postgraduate diploma in physics at a SEPnet partner. Entry to either year is subject to the availability of appropriate courses and/or projects and the suitability of the applicant for the intended programme. International students, please see the 'International students' section from page 144.

Further information
Professor David Burgess,
Tel: +44 (0)20 7882 5460,
email: d.burgess@qmul.ac.uk

Dr Andreas Brandhuber
Tel: +44 (0)20 7882 5375
email: a.brandhuber@qmul.ac.uk

MSc and Diploma in Astrophysics

One year full-time, two years part-time

Postgraduate Certificate in Astronomy and Astrophysics

Nine months part-time

For these programmes see the School of Mathematical Sciences entry in this prospectus, see pages 104-105.

Elisa Piccaro, PhD in Particle Physics

"I did my undergraduate degree at Queen Mary, and found the lecturers very helpful and well prepared. So when I graduated I decided to start here as a research student in particle physics, sure of the fact that I was going to get the same support and encouragement.

"I particularly value the day to day supervision I receive. This gives me valuable feedback about my work and progress. The postgraduate courses during the first semester of the first year were really helpful. They gave me important theoretical background, necessary for my research.

"I also really enjoy the seminars organised by the School of Physics. They are always interesting and give me some knowledge of what else goes on in other experiments, as well as theoretical physics.

"All in all, it's a great place to study."

Research

We welcome postgraduate students and visiting research fellows to undertake research in our areas of interest (see below). Research students are registered for University of London degrees (PhD) and work under the supervision of members of academic staff.

Students may receive financial support (research studentships) offered by the research councils (including CASE studentships in collaboration with an industrial sponsor). A limited number of College studentships are also available.

Entry requirements

Students accepted for postgraduate study usually have a first, or good upper-second class, honours degree in mathematics, physics, electronic engineering, computer science, or a related discipline from a British university, or the equivalent from an overseas university.

International students, please see the 'International students' section from page 144. Students with upper second class (or better) BSc honours degrees, or equivalent, are eligible to apply for admission to research degrees.

Research areas

Research in the School is focused in three main areas:

- **Experimental Particle Physics**
- **Condensed Matter Physics**
- **Theoretical Physics**

Particle Physics Research Centre (PPRC)

Research in Particle Physics Research Center (PPRC) at Queen Mary concentrates in the following core areas of particle physics (please note, the experiments in which the group is involved are indicated in parentheses):

- Standard Model and beyond at hadron colliders (Atlas and its upgrade)
- Neutrino physics (T2K and its upgrade, SNO+)
- Flavour Physics (SuperB, BaBar).

Experiments currently underway:

- PPRC is participating in the ATLAS Experiment at the Large Hadron Collider (LHC) at CERN. The LHC started operations in 2010 and should provide definitive answers to questions such as whether the Higgs mechanism is correct and whether Supersymmetry exists. The group is particularly involved in the study of the top quark, Higgs production, the structure of the proton and searches for deviations from the standard model. Queen Mary has made major contributions to the architecture, design and software of the Level-1 Calorimeter Trigger, and contributed to the design of the silicon detectors, the front-end electronics and the construction of modules of the ATLAS Semiconductor Tracker. The group is now participating in the analysis of the data, operations of both systems at CERN, and preparing for their future upgrade.

- The T2K (Tokai-to-Kamioka) experiment is a long baseline neutrino experiment that probes physics beyond the Standard Model aiming to measure for the first time the muon into electron neutrino oscillations. Moreover, several more major measurements are planned, in particular the muon neutrino disappearance and neutrino-nucleon cross sections. T2K, which started collecting data in 2010, consists of the world's most powerful neutrino beam, generated at the JPARC facility in Japan, the 'ND280' near detector, which measures the beam before it oscillates, and the 'SuperKamiokande' far detector 295km away. The PPRC group made major contributions to the design and construction of the near detector Electromagnetic Calorimeters and is now involved and providing leadership in neutrino oscillation and cross section analyses, as well as work on data quality, event reconstruction and calibration.

- SNO+ is a multi-purpose low energy neutrino experiment, currently under construction in an active Nickel mine in Canada, due to start taking data in 2012. The main goals of SNO+ are: the measurement of low energy solar neutrinos as a probe of oscillation mechanisms and new physics, a search for neutrino-less double beta decay, the so called golden-channel for testing the nature and mass of the neutrino, measurement of anti-neutrinos from nearby nuclear reactors and geo-neutrinos produced by radioactive decays in the Earth's crust and mantle. PPRC is contributing to the calibration system in the SNO+ experiment and providing analysis leadership.

- Construction of a new particle physics laboratory called SuperB was recently approved in Italy and members of PPRC are involved in this project. We provide physics coordination, are involved in the construction of the silicon vertex tracker for SuperB and also provide computing facilities. This experiment is primarily devoted to the search

Staff profile: Francesca Di Lodovico

Reader in Experimental Particle Physics

"My interests are in understanding the properties of the elementary particles in the lepton and quark sectors. I am currently involved in the long-baseline neutrino experiment T2K (see **http://pprc.qmul.ac.uk/research/t2k**) based in Japan, which will investigate muon to electron neutrino oscillations, aiming to perform the first observation of this process.

"My passion for discovering new and exciting results which result in a step forward in our understanding of how the laws of nature work is what led me to work in this area. I started during my PhD looking for the Higgs boson at LEP, then I moved to BaBar where CP violation was discovered. My hope is that CP violation will also be discovered in the neutrino sector.

"A non-zero oscillation value of the muon to electron neutrino oscillation could hint at CP violation in the neutrino sector, which could explain the current matter-antimatter asymmetry in the Universe. CP violation is a very hot topic, and the Nobel Prize in Physics in 2008 was awarded to two scientists, Kobayashi and Maskawa, who gave a framework to interpret the CP violation in the quark sector.

"Students, together with post-doctorate staff, are the people who do the actual research analysing data. They are guided by staff members, but they all contribute with original analyses to the experiment results.

"The School of Physics has an international reputation for its research. The breadth of research is made possible by the excellent interaction between different research groups, who share their enthusiasm and findings via regular seminars and a wealth of specialised discussion groups."

for signs of new physics. We are working on searches for charged lepton flavour violating decays and on measurements of CP-violation, a delicate asymmetry between matter and antimatter in B and D meson decays. This asymmetry is thought to explain why the universe is made predominantly of matter, rather than antimatter. Finally, we are among the authors of the global fitting programme (UTfit) to extract standard model quantities from worldwide measurements.

- Grid development is an area of central importance to the Queen Mary Particle Physics group who are heavily involved in the setting up of a global computing resource to analyse data from current and future particle physics experiments. Moreover, the PPRC group is also involved in the development of another data storage system, iRODS, and on digital preservation for particle physics data.

In addition to these experiments, the group has several programmes of detector development for which it is taking leadership roles, in particular an upgrade of the ATLAS experiment at CERN, including industrial collaboration, and development of liquid argon detector technology, which could be used for a new upgraded far-detector for T2K, to measure CP violation, and the SNO+ experiment.

Research students join one of these international collaborations described above, and attend the University of London intercollegiate lectures on particle physics prior to spending some time at one of the laboratories.

Staff research interests

Adrian Bevan PhD(Cantab)
Lecturer
BaBar and ATLAS

Marcella Bona PhD(Torino)
Lecturer
ATLAS

Lucio Cerrito PhD(Lond)
Lecturer
ATLAS

Francesca Di Lodovico PhD(Zurich)
Reader in Experimental Particle Physics
T2K and BaBar

Peter Kalmus PhD(Lond) FInstP CPhys OBE
Emeritus Professor of Physics
Contribution to the discovery of the W and Z particles; Outreach

Steve Lloyd PhD(Lond) FInstP CPhys
Professor of Experimental Particle Physics, Director of Research
ATLAS and GridPP

Alex Martin PhD(Bris)
Senior Lecturer
ATLAS and GridPP

Eram Rizvi PhD(Lond)
Senior Lecturer
ATLAS and H1

Graham Thompson PhD(Lond) FInstP CPhys
Professor of Physics
ATLAS and H1

Jeanne Wilson PhD(Cantab)
Senior Lecturer
T2K

Condensed Matter and Materials Physics (CCMMP)

The Centre for Condensed Matter and Materials Physics (CCMMP) carries out experimental and theoretical research in condensed matter. Key themes include organic conductors, structure-property relations, and disordered and nanoscale materals.

The experimental work of the CCMMP involves both laboratory techniques and significant use of international radiation-beam facilities.

Laboratory experimental techniques include a range of electrical and optical characterisation techniques – in the areas of picosecond photoconduction and high pressure spectroscopy the group is a world leader – high resolution x-ray diffraction, solid state diffusion and mechanical testing, with facilities for measurements at high-magnetic fields and at low temperatures. The group also uses the techniques of scanning probe microscopy and scanning electron microscopy to create nanostructures for molecular electronics studies. Facilities-based work includes neutron scattering, muon spectroscopy, and techniques exploiting the nature of beams of x-rays generated at synchrotron sources. This work is concerned with studies of local structure, magnetism and atomic-scale dynamics.

The CCMMP has recently established a group using computer simulation methods. The techniques range from accurate quantum mechanical methods through to massive-scale molecular dynamics. Applications are in the area of understanding disordered materials and fluids, molecular crystals, phase transitions, structure-property relations and damage to materials by nuclear radiation.

The group has extensive collaboration with industrial, government and academic laboratories in the UK, Europe, North America, China, India and Japan.

Staff research interests

Mark Baxendale PhD(Lond) MinstP CPhys
Reader in Nanotechnology
Nanotechnology

John Dennis DPhil(Sus) MRSC CChem Csci
Reader in Molecular Nanostructures
Nano-electronics and quantum information processing

Research areas

Martin Dove PhD (Bham) FInstP
Professor and Director of the Centre for Condensed Matter and Materials Physics
Atomistic simulation, neutron scattering, phase transitions, local structure

Alan Drew PhD(St Andrews) MInstP
Leverhulme Research Fellow and Lecturer, Director of Graduate Studies
Superconductivity, spin/charge transport in organic material, multiferroics, muon spectroscopy

Kevin Donovan PhD(Lond) MInstP CPhys
Reader in Molecular Physics
Transient photoconductivity, electric field induced polarisability

David Dunstan PhD(Hull) ScD(Cantab) FInstP FRSA
Professor of Experimental Physics
High-pressure properties of matter, coherency strain

William Gillin PhD MInstP CPhys
Reader in Experimental Physics
Optoelectronics and photonics

Theo Kreouzis PhD(London) MInstP Cphys
Lecturer
Charge carrier transport in organic semiconducting systems

Alston Misquitta PhD(Delaware)
Lecturer
Atomistic simulations, development of interatomic potentials, molecular crystals

Anthony Phillips PhD(Cantab)
Lecturer
Optoelectronic materials, crystallography

Andrei V Sapelkin PhD(DMU)
Lecturer
XAS3, DIAMOND, nanomaterials

Kostya Trachenko PhD(Cantab)
Senior Lecturer
Computer simulation, liquids and glasses, radiation damage

Centre for Research in String Theory (CRST)

Research in the Centre for Research in String Theory (CRST) focuses on string theory and its many applications in physics and mathematics.

String theory is currently our best candidate for a theory which unifies gravity with the other fundamental forces (the strong nuclear, the weak nuclear and the electromagnetic forces) – it is a proposed 'Theory of Everything'. String theory was discovered in the 1960s by nuclear theorists. The birth of string theory as a possible 'Theory of Everything' came when it was suggested that string theory was not a theory of hadrons and mesons, but was a fundamental theory, with the massless spin two particle identified as the graviton – the conjectured carrier of the gravitational force.

The 'first string revolution' occurred in the early 1980s, when researchers at Queen Mary and Cal Tech discovered superstrings. Soon after, new 'heterotic' strings were found, leading to a total of five superstring theories, labelled I, IIA, IIB, HE, HO.

A 'second string revolution' occurred around 1995 in work at Queen Mary, Cambridge and Princeton. 'Duality' symmetries between different string theories were found, which led to the proposal that the five known theories are different realisations of one underlying fundamental theory, called 'M theory', whose low energy limit is eleven-dimensional supergravity. Furthermore, the fundamental objects in string theory and M theory were found to include higher dimensional surfaces called 'branes' as well as strings.

A new paradigm of gauge-string duality emerged in the late nineties, where gravity, strings and branes emerge from gauge theory at large N. The twistor string-gauge theory duality found in Princeton in December 2003 and developed further at Queen Mary, has led to dramatic progress in practical calculations of scattering amplitudes. This is relevant to forthcoming experiments at the LHC at CERN in Geneva as well as giving new insights into the structure of gauge theory.

Other areas of active research in current string theory include the study of time-dependent and cosmologically relevant aspects of brane dynamics, multi-matrix models and Brauer algebras in connection with emergent D-branes from gauge theory, integrability and new geometries in string theory. Queen Mary researchers play leading roles and are involved actively in these and other new areas of research.

Staff research interests

David Berman PhD(Durham)
Reader in Theoretical Physics
M-theory

Andreas Brandhuber PhD(Vienna, CERN)
Reader
String theory, supersymmetric gauge theories, and their interactions

John Charap PhD(Cantab) FInstP CPhys
Emeritus Professor of Theoretical Physics
Einstein's general relativity theory, string theory

Sanjaye Ramgoolam PhD(Yale)
Reader in Theoretical Physics
String theory, M-theory

Rodolfo Russo PhD(Torino)
Lecturer
String theory, gauge theory

Bill Spence PhD(Lond)
Professor of Theoretical Physics
Head of School
String theory, M-theory

Steve Thomas PhD(Lond)
Professor of Theoretical Physics
Superstrings

Gabriele Travaglini PhD(Roma)
Reader in Theoretical Physics
String theory, gauge theory

Essential information

How to apply

Application method

Applications should be made on the official application forms.

There are two ways in which you can apply for a postgraduate programme:

1) Apply online – using our online application form
This is our preferred method of application.

Please go to our website for further details of how to apply online:
www.qmul.ac.uk/postgraduate/apply/index.htm

2) Paper-based application
You can download a paper-based application form from our website:
www.qmul.ac.uk/postgraduate/howtoapply/index.html

Alternatively please contact the Admissions Office who will send the form to you, please specify which programme you are applying for.

Please complete carefully and return to the address at the bottom of the form.

The Admissions Office is happy to answer any application queries you may have, although if you would like more information on programme content, please contact the relevant department.

There are generally no closing dates for applications to postgraduate study, although entry to some programmes is very competitive and places may be full several months before

the start of the academic year. Please check the web pages for the school you wish to apply to for up to date information on any application deadlines.

If you are concerned about programmes filling up and would like advice on availability, please contact:

Admissions Office
Queen Mary, University of London
Mile End Road
London, E1 4NS
Freephone 0800 376 1800
If calling from outside the UK:
Tel: +44 (0)20 7882 5533
email: admissions@qmul.ac.uk
www.qmul.ac.uk

International students applying overseas may wish to contact one of our representatives in-country. For a full list of representatives' contact details, please visit:
www.qmul.ac.uk/international/countries

Please contact the school you are interested in if you would like further information on individual programmes or research areas. All schools have a head of graduate studies and an admissions tutor, who are listed in the appropriate sections in this prospectus.

To apply for research programmes, please first contact the relevant person in the school in which you would like to study.

Tuition fees

Undertaking postgraduate study is a serious commitment and involves careful financial planning at the time of application and for the duration of the programme. Your costs will comprise tuition fees and living costs.

You can find a full list of both UK/EU and overseas tuition fees here: www.qmul.ac.uk/tuitionfees

If you are in doubt as to whether you will be classed as an overseas or home student please consult the Admissions Office at an early stage.

Freephone (UK callers only): 0800 376 1800
Overseas callers: +44 (0)20 7882 5533
email: admissions@qmul.ac.uk

Please note:
No additional charges are made for registration, examinations, or membership of the Students' Union. Additional costs will be incurred, however, in the following cases:

- Students attending field or language courses away from the College will be required to pay part or all of the cost
- Examination re-entry fees are charged to students who are not in attendance
- Research students taking longer than twelve months after finishing their research to write up their thesis will become liable to pay a writing-up fee equivalent to the relevant part-time fee
- Research students who are, following a first assessment, required to re-enter the PhD or MPhil examination will be required to pay an examination re-entry fee.

The Research Councils and many other funding bodies (including those based overseas) pay fees direct to the College. Students who are not sponsored by public bodies, either in this country or elsewhere, are required to pay their fees either before, or at the time of enrolment at the beginning of the session.

Funding your study

Funding for research students

Possible funding sources to consider include:

- Queen Mary, University of London Research Studentships
- Research Council Studentships
- Professional and Career Development Loans.

Queen Mary, University of London Research Studentships

(Home, EU and International students)

The College offers a number of research studentships each year, which are tenable for up to three years. The studentships cover tuition fees and provide maintenance at the basic research council level (for guidance: £15,590 during the 2011/12 session). Any applicant for admission to a PhD programme to commence in the 2012/13 session will automatically be considered for a studentship, there is no separate application form. Details on the number of studentships available in each school can be obtained directly from the school. PhD studentships, including those linked to specific funded projects within the College, are advertised on our website as well as the following external websites: www.findaphd.com www.jobs.ac.uk, and www.postgraduatestudentships.co.uk

Research Council Studentships

(Home and EU students only)

These are the primary source of funding for Home and EU students and cover tuition fees and maintenance costs. They are available for research and some masters programmes. Candidates must ordinarily be resident in the UK for a period of three years prior to the date of application (excluding any period spent in further or higher education). The studentships are normally only available for candidates who have obtained a first degree of good honours standard.

For further information about funding via the respective Research Councils please visit their websites:

- Biotechnology and Biological Sciences Research Council (BBSRC): www.bbsrc.ac.uk
- Engineering and Physical Sciences Research Council (EPSRC): www.epsrc.ac.uk
- Science and Technology Facilities Council (STFC) (incorporating former Particle Physics and Astronomy Research Council (PPARC): www.scitech.ac.uk
- Natural and Environmental Research Council (NERC): www.nerc.ac.uk
- Medical Research Council (MRC): www.mrc.ac.uk

To be considered for research funding from the research councils, contact the relevant academic school for details on the application process. Most of the research councils now operate schemes where Queen Mary is given a set amount of funding and selects the students to whom this will be offered – prospective students do not apply directly to the research council.

Professional and Career Development Loans
(Home and EU students)
Postgraduate students wishing to undertake certain programmes to enhance their job, skills or career prospects, who cannot obtain alternative funding, may borrow a maximum of £10,000 to cover 80 per cent of tuition fees plus living expenses. Repayments are delayed and the Government pays the interest for the duration of your study and for one month afterwards. However, PCDLs are normally only available for courses up to two years long. You may wish to apply with the last two years of your course, if you have secured funding for the initial years. Details are available from the Directgov website (www.direct.gov.uk) and participating banks.

British Council Awards
(International students only)
A number of scholarships are awarded via the British Council overseas. These include Chevening scholarships. This scheme operates in approximately 70 countries. The British Council publicises the awards and is responsible for the selection of candidates.

See: www.britishcouncil.org, www.chevening.com

The British Council may also be able to give information on other funding operating in particular countries.

Commonwealth Scholarships
(International students only)
The Commonwealth Scholarships and Fellowship Plan (CSFP) is an international programme under which governments offer scholarships and fellowships to citizens of other commonwealth countries. Awards are focused on masters and doctoral level studies. For more information, go to www.csfp-online.org

China Scholarship Council scholarships
(International students only)
Queen Mary offers PhD Scholarships with the China Scholarship Council. These are available to students from China for PhD study in various areas. Under this scheme Queen Mary, University of London provides a scholarship to cover all tuition fees and the China Scholarship Council (CSC) provides living expenses and one return flight ticket to successful applicants. For more information, please refer to: www.qmul.ac.uk/international/scholarships/index.html#CSC

Queen Mary, University of London
– Bangladesh Capacity Building Scholarships
(International students only)
Queen Mary is keen to contribute actively to the development of the higher education sector in Bangladesh and as such is pleased to offer two Queen Mary, University of London – Bangladesh Capacity Building Scholarships. Each of these scholarships will provide full tuition fees for full time MPhil/PhD study at Queen Mary in one of the following areas: Biological and Chemical Sciences, Computer Science, Electronic Engineering, Engineering, Materials, Mathematical Sciences and Physics.

For more information, please see: www.qmul.ac.uk /international/scholarships

Queen Mary, University of London – India Capacity Building Scholarships
(International students only)
Queen Mary is keen to contribute actively to the development of India's higher education sector and is pleased to offer two Queen Mary, University of London – India Capacity Building Scholarships. Each of these scholarships will provide full tuition fees for full time MPhil/PhD study at Queen Mary in one of the following areas: biological and chemical sciences; computer science; electronic engineering; engineering; materials; mathematical sciences; physics.

For more information, please see: www.qmul.ac.uk/ international/scholarships

Queen Mary, University of London – Pakistan Capacity Building Scholarships
(International students only)
Queen Mary is keen to contribute actively to the development of Pakistan's higher education sector and is pleased to offer two Queen Mary, University of London – Pakistan Capacity Building Scholarships. Each of these scholarships will provide full tuition fees for full time MPhil/PhD study at Queen Mary in one of the following areas: biological and chemical sciences; computer science; electronic engineering; engineering; materials; mathematical sciences; physics.

For more information, please see: www.qmul.ac.uk/ international/scholarships

Queen Mary, University of London – Turkey Capacity Building Scholarships
(International students only)
Queen Mary is keen to contribute actively to the development of Turkey's higher education sector and is pleased to offer two Queen Mary, University of London – Turkey Capacity Building Scholarships in association with the Turkish Ministry of Education (MEB). Each of these scholarships will provide full tuition fees for full time MPhil/PhD study at Queen Mary in one of the following areas: biological and chemical sciences; computer science; electronic engineering; engineering; materials; mathematical sciences; physics.

For more information, see: www.qmul.ac.uk/ international/scholarships

Funding for taught masters students

Professional and Career Development Loans
(Home and EU students)
Postgraduate students wishing to undertake certain programmes to enhance their job, skills or career prospects, who cannot obtain alternative funding, may borrow a maximum of £10,000 to cover 80 per cent of tuition fees plus living expenses. Repayments are delayed and the Government pays the interest for the duration of your study and for one month afterwards. However, PCDLs are normally only available for courses up to two years long. You may wish to apply with the last two years of your course, if you have secured funding for the initial years. Details are available from the Directgov website (www.direct.gov.uk) and participating banks.

There are also some school specific scholarships and bursaries for international students. Please refer to www.qmul.ac.uk/international/scholarships

Living costs

The cost of living in London depends on your lifestyle. Typically, however, postgraduates need at least £11,000 to cover food, accommodation, travel, books and so on for a full year (52 weeks), plus adequate funds to maintain any dependants. International students will need to show evidence of having at least £7,200 for living costs plus 100 per cent of tuition fees in order to obtain Entry Clearance under Tier 4 of the UK Border Agency's Points Based System of immigration. Additional amounts need to be shown for dependants. £7,200 is based on nine months of study and is an immigration requirement only.

Please note that while the College will offer advice to students who encounter financial difficulties, it is not able to fund postgraduate students who have started a programme without adequate or reliable funding. Although hardship funds may be available, payments are small and cannot cover fees or compensate for not having adequate funding in place. There are no mandatory awards for postgraduate study, and alternative funding sources are limited.

Consequently it is vital that you consider how you will pay your fees and maintain yourself at an early stage in the application process. All funding information for taught and research students is available on our website. Please visit:
www.qmul.ac.uk/postgraduate/feesfunding
www.welfare.qmul.ac.uk

Casual/part-time paid work – earning while you study

Working part-time while you study will help you supplement your income and add valuable work experience to your CV. However, you must be careful that any work you take on does not infringe on your studies. International students can work for up to 20 hours a week during term and full-time during the vacations; there are no restrictions on the number of hours Home or EU students can work.

At Queen Mary, we offer various opportunities for flexible paid work at the University, both during term-time and vacations. Opportunities could include working as a marketing assistant in our communications department, tutoring in the local area, assisting with conferences, working as student ambassador, mentoring local school students, working in one of the University's cafés or restaurants or acting as a steward in College accommodation. There are, of course, numerous other opportunities for part-time work in and around London.

Financial advice and guidance

Our experienced Welfare Advisers in the Advice and Counselling Service have specialist training to offer you professional advice on a range of financial issues. Our aim is to advise you about possible financial solutions and options, so that you can concentrate on your academic progress. Most of our work is about helping you with your rights and entitlements, including:

- postgraduate funding
- financial support for student parents (childcare costs etc)
- fee status
- planning a budget
- dealing with debt
- welfare benefits and tax credits
- hardship funds
- funding from trusts and charities
- council tax.

As well as helping you to find solutions to problems, we can give you information and advice to help you to avoid problems before they happen. We can also give you advice before you start your studies.

For example, we can help you to plan a budget, and check that you are getting all the funding that you are entitled to. We can offer you advice by telephone if you cannot attend in person: Tel: +44 (0)20 7882 8717
www.welfare.qmul.ac.uk

For your Postgraduate Funding Guide, please visit www.welfare.qmul.ac.uk/documents/leaflets/funding/5071.pdf

Further information

If you have any queries about tuition fees or the scholarships and bursaries available through Queen Mary, please do not hesitate to contact us:
Admissions Office
Queen Mary, University of London
Mile End Road
London E1 4NS
Tel: +44 (0)20 7882 5533
email: bursaries@qmul.ac.uk

International students

Queen Mary has a cosmopolitan graduate community, with students from all over the world making a valuable and active contribution to academic and social life. Whether or not you have studied in the UK before, you will find a very warm welcome at the College.

Entry requirements

Each application received at Queen Mary is evaluated on a case-by-case basis, comparing international and UK qualifications. We look both at your qualifications, the institution you have attended, and where necessary any relevant work experience. You can find detailed country specific entry requirements on our website: www.qmul.ac.uk/international

Support for international students

We offer a range of support services to help our international students feel at home.

Airport collection

New international students are offered a free airport collection service before the start of term in September 2012. This service will be advertised on our website along with an online booking form: www.qmul.ac.uk/prearrival

The welcome programme

A welcome programme will be provided for all new international students before the start of term in September 2012. This is an opportunity to meet other international students studying a variety of programmes and gain practical advice about living and studying in London. Following the welcome programme, students can take part in a number of social events throughout the year. In 2011, these included trips to Amsterdam, Bruges, the Scottish Highlands, Wales and the Wye Valley.

Advice and Counselling

The Advice and Counselling Service offers professional advice and support to international students. We can advise you on finance and funding, Tier 4 Entry Clearance, Tier 4 extensions, immigration problems, UK work schemes after study, and offer counselling support for personal/emotional issues. See for further details: www.welfare.qmul.ac.uk

As a member of the international community at Queen Mary, you will automatically have membership of International Students' House (ISH) in central London. ISH offers a wide range of services to international students including advice on travel, accommodation and an extensive social programme. For details of these and other services please see the ISH website: www.ish.org.uk

Healthcare

There is a Student Health Service on campus. You (and your spouse and children if they are in the UK with you as your dependants) are entitled to free medical treatment on the UK National Health Service (NHS) if you are registered on a programme lasting six months or longer. If your programme lasts for less than six months, you should make sure you have adequate medical insurance cover. If you are an EEA national, you should obtain a European Health Insurance Card (EHIC) before coming to the UK, which entitles you and your family to full NHS treatment.

For more information, please visit our website: www.studenthealth.qmul.ac.uk

Living costs

International students will need to show evidence of having at least £7,200 for living costs plus 100 per cent of tuition fees in order to obtain Entry Clearance under Tier 4 of the UK Border Agency's Points Based System of immigration. Additional amounts need to be shown for dependants. £7,200 is based on nine months of study and is an immigration

requirement only – most students require more money than this for 12 months' living costs – normally around £11,000. For further information please visit www.welfare.qmul.ac.uk/international/money

Scholarships

We constantly seek students of the highest quality, and, in recognition of the important investment that international students are making in their education, we are pleased to offer a range of scholarships to reward outstanding academic achievement.

For 2012/13, there will be a number of scholarships available for international students, in many subjects including biological sciences, computer science, electronic engineering, engineering, materials, physics and more. Details of the various scholarships or bursaries available for international students can be found at www.qmul.ac.uk/international/scholarships and see pages 141-142.

Representatives in your country

In many countries we have offices or educational representatives, who you can visit to discuss applying to Queen Mary. Contact details can be found at www.qmul.ac.uk/international/countries

International Office

Members of staff at Queen Mary regularly make visits overseas to meet with students and academic institutions. To see when we'll see be visiting your region or for more information on any aspect of life at Queen Mary as an international student, please see our website: www.qmul.ac.uk/international/events

or contact us:
International Office
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk
www.qmul.ac.uk/international

English language

All tuition and examinations at the College are in English, so a sound command of the language is essential for success in any course of study, or when following a research degree. Queen Mary provides a number of programmes in English for academic purposes to help international students get the most out of their study. You need to be able to cope with reading, note taking from lectures, books, journals and other materials; to speak well in seminars, discussions groups and tutorials; and to present yourself effectively in written assignments and examinations.

English language requirements

If your first language is not English, you must provide evidence that your English skills are sufficient by including with your application details of recognised language qualifications and experience in using the language. If you are an international applicant you are strongly advised to contact your local British Council Office, take the IELTS (International English Language Testing Service) test and submit the results with your application. The College's minimum requirement for postgraduates is an IELTS score of 6.5, or TOEFL 580 (internet-based TOEFL 92 or PTE Academic 68). However, some courses, may require a higher score. For detailed English language entry requirements for all of our programmes including individual component scores, you should check www.qmul.ac.uk/international For many nationals, it is now also an immigration requirement that you sit a secure English language test.

Applicants who present English language scores slightly below the required band may be eligible to attend a pre-sessional English Language Summer programme (see over) before the start of their course.

English Language Summer programmes
(pre-sessional programmes)

From June to September, we arrange a series of English language programmes for students who wish to improve their proficiency in English before starting their university studies. The programme aims to enhance ability in the four language skills of listening, speaking, reading and writing; to teach study skills such as note-taking, academic writing and seminar participation; to develop skills essential to working independently at postgraduate level; and to familiarise you with life in Britain. We encourage independent work and use of English by setting individual projects. Queen Mary academic staff and other visiting lecturers will participate by giving a series of introductory guest lectures. We provide residential accommodation on summer programmes in the College's halls of residence.

Year-round English programmes
If you need a longer period to improve your English, you can join the year-round Campus English Programme. The minimum entry level for this programme is IELTS 4.0 or TOEFL 450 (computer-based TOEFL 133; internet-based TOEFL 40) and it aims to improve overall ability in English grammar, vocabulary, speaking, listening, reading and writing. There are monthly enrolments.

Pre-Masters Programmes
If you need to improve your English and academic skills and become familiar with the UK system before postgraduate study, you can join one of our Pre-Masters Programmes. The minimum entry level is IELTS 5.5 or TOEFL 530 (computer-based TOEFL 197; internet-based TOEFL 71). For further information, contact the English Language and Study Skills office or see www.languageandlearning.qmul.ac.uk/premasters

Insessional English language support
For students who were educated in a language other than English and need to improve their command of the language for study purposes, the Language and Learning Unit runs a series of insessional English programmes in academic writing, grammar and vocabulary, lecture comprehension and seminar skills and general English during the main teaching periods of the academic year. **These are free of charge.**

Academic study support
To help students with the transition to higher degree study, the Language and Learning Unit runs a programme of short courses, tutorials and drop-in classes in such skills as organisation and time management, research and note-taking, oral communication and presentation, academic writing, personal development planning and revision and examination skills.

For more information about English Language and Academic Study programmes:
English Language and Study Skills Office
Tel: +44 (0)20 7882 2827
email: elss@qmul.ac.uk
www.languageandlearning.qmul.ac.uk

Join us

Visiting Queen Mary – Campus Tours

The best way to find out more about Queen Mary is to come and see it for yourself. The Education Liaison Office organises Campus Tours throughout the year. These are informal and restricted to small groups so everyone has the chance to ask questions. They are a great way of finding out about living and studying here and normally last about one hour. You will be shown around by a current student.

Postgraduate Open Evening

Queen Mary offers prospective students the opportunity to attend a College Open Evening. The Open Evening gives visitors the opportunity to hold individual discussions with school representatives, visit subject specific facilities, tour the general research and learning provision available on campus and speak to all the Queen Mary support services including Careers and Admissions staff.

The Open Evening is held at the Mile End campus for students wishing to apply to schools in the Arts, Humanities, Social Sciences, Science and Engineering and Medicine and Dentistry.

The date for the next Open Evening is the 1st February 2012. To book your place:
email: askthegradteam@qmul.ac.uk
www.qmul.ac.uk/pgopenevening

Contacts

Queen Mary, University of London
Mile End Road
London
E1 4NS
www.qmul.ac.uk

Admissions Office
If you have an admissions enquiry please contact:
Admissions Office
Freephone (UK callers only) 0800 376 1800
Tel: +44 (0)20 7882 5533
email: admissions@qmul.ac.uk

International Office
If you are an international student please contact:
International Office
Tel: +44 (0)20 7882 3066
email: international-office@qmul.ac.uk
www.qmul.ac.uk/international

How to find us

Underground
Queen Mary's Mile End Campus is located between Mile End station (Central, District, Hammersmith and City lines) and Stepney Green station (District, Hammersmith and City lines). Both stations are in London Underground Zone 2.

Buses
All of our campuses are well served by London bus routes. Please check the Transport for London website for detailed bus route maps and timetables. There's also a useful interactive journey planner: www.tfl.gov.uk

Docklands Light Railway (DLR)
The nearest DLR station to Queen Mary is Bow Church, a short walk or bus ride from the College.

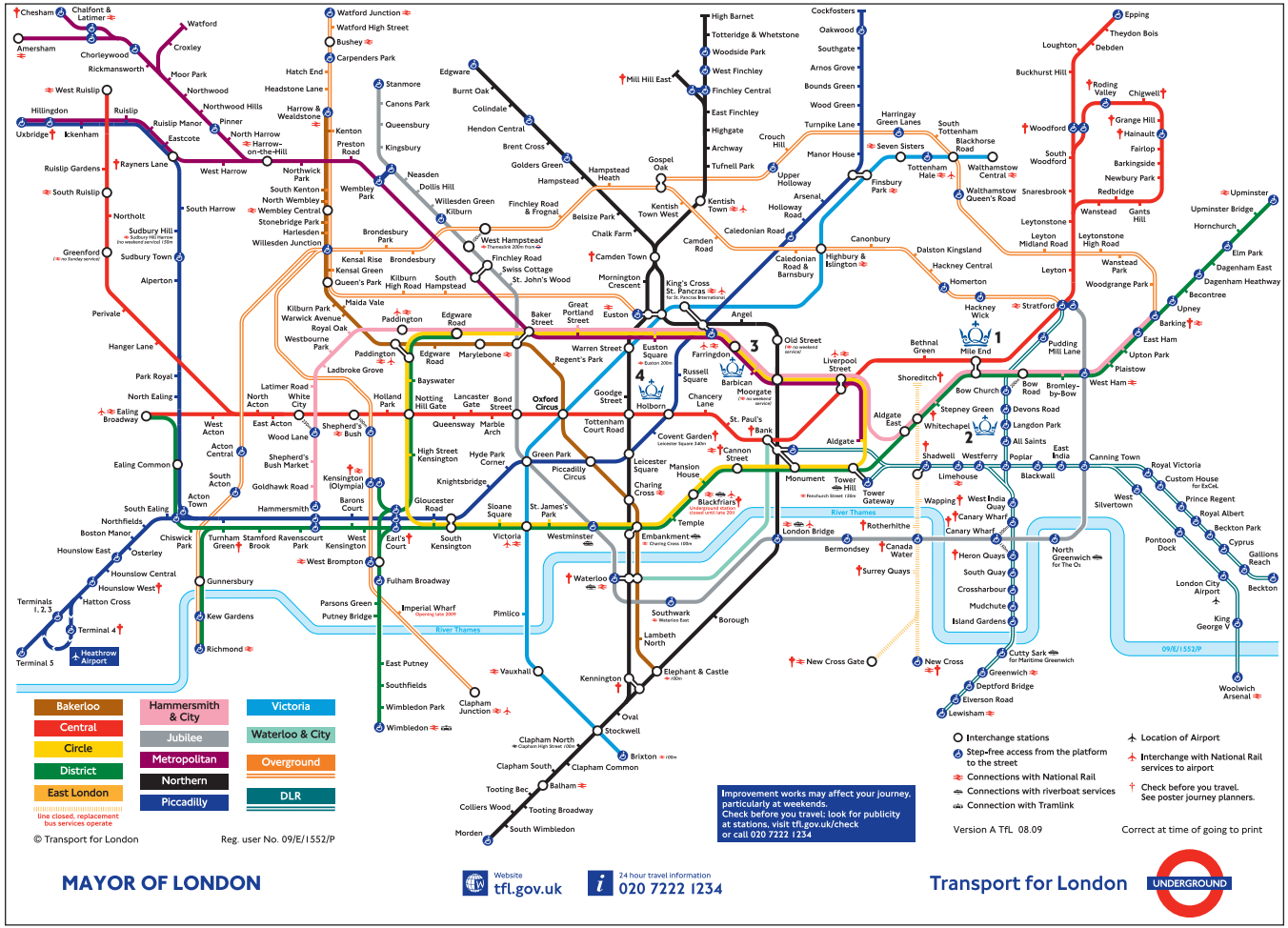
Travelcards and Oystercards
Daily, weekly, monthly or yearly Travelcards are the best, most cost-effective way to pay for public transport in London. (Buying tickets for single journeys is much more expensive). Load your tickets and Travelcards on to an Oystercard (London's travel smart-card).

Cars
Traffic is heavy and parking difficult, making driving in London an unattractive option. There are no parking places for students on campus, with the exception of students displaying an authorised blue disabled sticker (who have applied for and received a College parking permit). Contact the Disability and Dyslexia Service for advice on 020 7882 2756.

Taxis
Black cabs use a meter to calculate your fare and you can hail one in the street. They are safe to use, but can be expensive. Mini-cabs are normal cars and charge a fixed price. Only use registered mini-cab firms. If you want to find the licensed minicab and black cab operators in your area, you can text HOME to 60835. For more information, see: www.tfl.gov.uk/pco/findaride

Trains
London is very well served by train stations, all within easy reach of Queen Mary's campuses. The closest is Liverpool Street, just two stops from Mile End on the underground (Central line). Trains from Liverpool Street run to Stansted Airport, as well as other destinations. King's Cross and St Pancras (for Eurostar services to mainland Europe and Luton Airport) are both a short journey from Mile End on the Underground's Hammersmith and City line. London Bridge and Fenchurch Street are also close by.

Airports
The closest airport is London City Airport – just five miles away – which offers regular flights to UK and other European cities. Heathrow, Gatwick, Luton and Stansted are within easy reach of the College, and all can be reached in anything from one to two hours by train or Underground.



1. Mile End Campus
2. Whitechapel Campus
3. Charterhouse Square Campus
4. Postgraduate Law Centre

Campus map

Mile End Campus Map Index

Educational / Research

Residential

Facilities

No Smoking policy on campus
CCTV operates on this campus

G.E. Fogg Building, home to our Biological and Chemical science students

Degree programme index

General index

Notes

Notes

Notes

www.qmul.ac.uk

The information given in this prospectus is correct at the time of going to press. The College reserves the right to modify or cancel any statement in it and accepts no responsibility for the consequences of any such changes. For the most up-to-date information, please visit www.qmul.ac.uk

We would like to thank the Students' Union for providing some images, as well as all the students who took part in photographs. Student and departmental photography by Jonathan Cole (www.jonathanjamesphotography.com)

Any section of this publication is available upon request in accessible formats (large print, audio, etc). For further information and assistance, please contact: Diversity Specialist, hr-equality@qmul.ac.uk, 020 7882 5585

Designed and produced by Creative Services,
Queen Mary, University of London
http://qm-web.corporateaffairs.qmul.ac.uk/ creativeservices

Printed by MWL Print Group, Wales.

This publication has been printed using vegetable oil based inks on environmentally friendly material from sustainable sources (from the Hello paper range).

The eco-friendly low carbon printing company is ISO 14001 accredited, and operates a 'Cradle to grave Environmental Management System', ensuring environmental impact is minimised throughout every aspect of print production. Key focus is placed upon energy saving, reductions of chemicals and emissions, water conservation, and waste minimisation.

Are we the right choice for you?

Postgraduate study is an excellent way to enrich your academic experience and open up new career opportunities. Queen Mary, University of London is the right choice because:

- We are a research-led institution with an international reputation. Our performance in the last Research Assessment Exercise confirmed this; we are ranked 11th overall in the UK (*The Guardian*)
- We offer postgraduate students teaching and supervision by leading researchers in their academic fields – a thriving and stimulating research community
- We are one of the largest colleges of the University of London – graduate students have access to resources and facilities in the wider University as well as those at Queen Mary
- We are the only multi-faculty University of London college to benefit from an integrated teaching, research and residential campus in central London
- We offer a wide range of subjects in: Humanities; Laws and Social Sciences; Engineering, Mathematical Sciences and Natural Sciences. Queen Mary also incorporates the Barts and The London School of Medicine and Dentistry.
- We offer an international environment, with students from over 125 countries.

Queen Mary
University of London

We offer taught masters courses and PhD research opportunities in the following areas:

- Astronomy
- Biological and Chemical Sciences
- Computer Science
- Electronic Engineering
- Engineering and Materials Science
- Mathematical Sciences
- Physics
- Statistics

Scan the code to find the right Queen Mary programme for you.

QR readers can be downloaded for free online. Data charges may apply. Please contact your network provider for more details.

Queen Mary, University of London
Mile End Road
London
E1 4NS
Freephone: 0800 376 1800

If calling from outside the UK:
Tel: +44 (0)20 7882 5533
Fax: +44 (0)20 7882 5588
email: admissions@qmul.ac.uk