Queen Mary, University of London
Science and Engineering Postgraduate Prospectus Entry 2013

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 158.

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

For admissions enquiries, please contact:
Freephone: 0800 376 1800
If calling from outside the UK:
Tel: +44 (0)20 7882 5533
email: pgsmd@qmul.ac.uk

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

Visit us!
The next Postgraduate Open Evening for 2013 entry is on 06 February 2013.

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

www.qmul.ac.uk

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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 and Executive Dean, Science and Engineering

Faculty highlights

- Around 250 postgraduate taught students, 450 full-time research degree students, 100 postdoctoral researchers and over 250 academic staff members.

- Annual turnover of £70m, of which £20m is competitively awarded research income.

- A focus on student satisfaction and employability: in the National Student Survey 2011 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.

- The £3m ImpactQM project, launched in 2009, linking early career researchers with selected industry partners to exploit the Faculty's strengths in materials, electronic and mechanical engineering, and computer science continues to thrive and benefit our research.

- Many successful spin-out companies – including ApaTech, a manufacturer of synthetic bone substitutes, which was awarded the top prize in the PraxisUnico Impact Awards.

- The £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.

- The College is now one of the EPSRC's 11 strategic relationship institutions, enabling us to share information and strategies and spread best practice.

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

- Computer Vision
- Risk & Information Management
- Interaction, Media and Communications
- Centre for Digital Music
- Media and Arts Technology EPSRC Doctorial Training Centre
- Networks
- Antennas and Electromagnetics
- Centre for Condensed Matter and Materials Physics
- Centre for Life Sciences
- Computer Theory
- Interdisciplinary Research Centre in Biomedical Materials
- NanoVision Centre
- Centre for Materials Research
- Centre for Aquatic and Terrestrial Environment
- Centre for Research in String Theory
- Particle Physics Research Centre
- Astronomy Unit
- QMedia
- Multimedia and Vision
- River Communities Research Centre
- Mathematics Research Centre
- Centre for Discrete Mathematics
- Research Centre in Biological 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 2013

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

Queen Mary, University of London

Queen Mary is 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

Our priority is to provide you with high-quality and relevant programmes of study. Alongside seminars and lectures, we offer research and transferable skills training, postgraduate-only study spaces, and many opportunities to present and discuss your work, helping you to get the very best out of your time with us.

Research excellence and innovation

We conduct world-leading research and have an impressive track record in initiating 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.

The Times Higher Education on the last RAE:

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

Researchers in the School of Electronic Engineering and Computer Science have recently won a grant of £4.5m to conduct research into transforming the science fiction of invisibility into practical technology in a project titled the Quest for Ultimate Electromagnetics using Spatial Transformations (QUEST). Science Magazine recently listed research in transformation optics among the top 10 science breakthroughs of the last decade.

Queen Mary joins the Russell Group

In recognition of our excellence in research and teaching, Queen Mary joined the Russell Group of leading UK universities in 2012. The Group, which includes other top universities such as Oxford, Cambridge and UCL, attracts the brightest students from all over the world and almost two thirds of research funding in the UK. Graduates from Russell Group universities are especially valued by employers, giving you a head start when you apply for jobs.

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 humanities and social sciences students have totalled more than £1m per year. For more information, see page 146.

Rankings highlights

- Ranked 11th in the UK by *The Guardian* for the quality of our research in the most recent Research Assessment Exercise (RAE)
- In the top 20 universities in the UK and in the top 130 in the world according to *The Times Higher Education 2011 World University Rankings*
- Ranked 8th in the UK for graduate starting salaries by *The Sunday Times University Guide 2012*

Postgraduate study at Queen Mary

- 3,699 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

Welcome to Queen Mary, University of London

Specialist facilities

Whatever your area of study or research, we provide a range of specialist facilities. Our engineering and materials science students 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 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 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.

Find out more about each School's specialist resources further on in this prospectus.

Mile End Library

Designed by the same architect as the British Library, the Mile End Library has recently benefited from a major refurbishment, which has created new spaces for postgraduate study and an archives reading room. 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.

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, until midnight during the week, and 24-hours-a-day over the summer exam period. In addition, most electronic resources are available day and night, on and off campus. Find out more at www.library.qmul.ac.uk

Mile End Library

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 and the collections in other University of London colleges.

A lab in the Centre for Digital Music

GE Fogg building foyer

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 has a rich and distinguished history. We have had a presence at our Mile End home since 1887, with the opening of the People's Palace, a philanthropic centre bringing education and culture to east London. Barts and The London School of Medicine and Dentistry dates back even further: The London Hospital Medical College, England's first medical school, was established in 1785, while St Bartholomew's Hospital was founded in 1123. To find out more, visit www.qmul.ac.uk/about/history

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.

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 confirmed Queen Mary's position as a leading, research-focused institute (see table right).

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 College.

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; Chatterbox Analytics, a spin-out company from the School of Electronic Engineering and Computer Science, which is developing a software platform enabling companies to identify and engage with their community of consumers in online interactive media such as Twitter and Facebook; 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

We run an international campaign to get young people interested in computer science called Computer Science for Fun. In one year alone, its website received 15 million hits worldwide. By engaging the local community and the younger generation in this type of 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 155. 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.

St Katherine's Dock, Wapping

Olympic 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

Olympic Stadium

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 urban 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

O2 Arena

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.

Brick Lane

Columbia Road, Flower Market

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

The Students' Union is here to represent and support you in your academic and welfare needs, encourage your personal development and ensure you enjoy your time at university. We will lobby and fight to secure the exceptional educational standards that all Queen Mary students deserve and ensure that your entire student experience is the best it can be.

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 studying, but also socialising and gaining new experiences outside the lab or lecture room. The Union also provides academic advice and welfare support during your studies.

Representation

QMSU is led by elected students who work to improve all aspects of your time at university. Elected trustees, student councillors, and course representatives all play a valuable role in forming the direction of the Union and providing valuable feedback to the university. These elected students will represent your views but for more direct involvement you can run for election.

Activities

QMSU offers several opportunities for you to get involved, make friends and explore your personal interests. With activities including volunteering, fundraising, campaigns, media, sports, societies, and employment, there is something for everyone.

Events and entertainment

QMSU puts on a range of events each year, from quiz nights and club nights to cultural celebrations and postgrad socials. Visit the website for a full schedule.

Bars, shops and cafés

On campus, QMSU runs several social spaces and venues for you to take a break, relax or grab something to eat. Visit Ground café, The Learning Café, The Village Shop, Infusion, or Drapers Bar and Kitchen to see what the Union has to offer.

Sport, health and fitness

Taking part in sport at university is a great way to keep fit, meet people and generally have a good time. QMSU has over 50 sports clubs as well as the new Get Active sports programme that provides 'give it a go' sessions and intramural leagues.

QMSU also runs Qmotion Health and Fitness Centre, home to a range of gym equipment including a cardiovascular zone, a resistance zone and free weights. There's also a women-only gym area, as well as a wide range of classes. Membership rates are subsidised for students.

To find out more about the Union visit: www.qmsu.org

Qmotion gym

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 and Kitchen – A recently renovated venue providing a relaxed and easy-going environment; offering burgers, pizzas, salads and sandwiches.

• Ground – A vibrant, high-street style café serving coffee, refreshing frappés, real fruit smoothies, sandwiches and pastries.

• Learning Café – Learning Café is located in the main library on the ground floor and serves tea and coffee and a large selection of sandwiches and salads, cakes, muffins and snacks.

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 our 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.

Some of our residences are reserved exclusively for postgraduate students, while in others you can share 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 150.

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-£138 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.
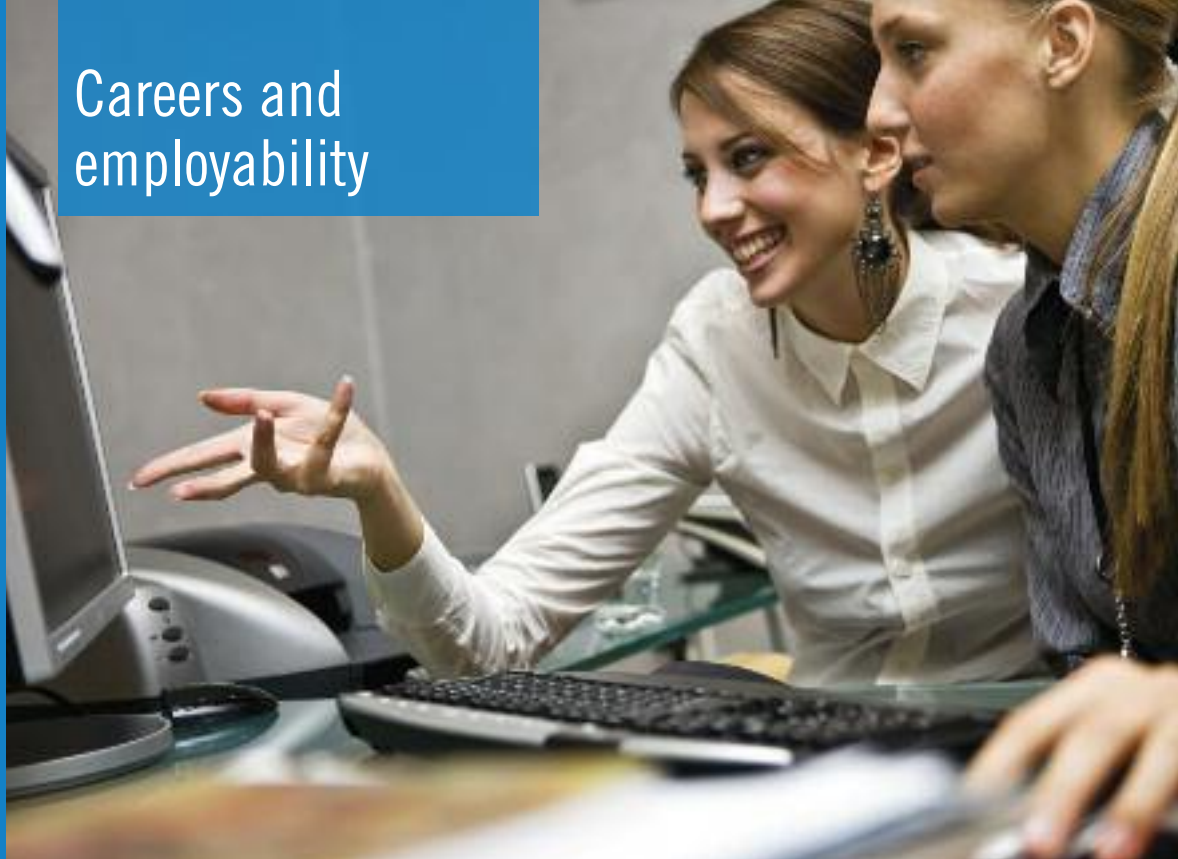
See what it's like

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, Atkins Global, Barclays, BAE Systems, Civil Service Fast Stream, EADS Astrium, Teach First and Transport for London. 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 most postgraduate taught courses lasting nine months, it's important that you make the best 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 much more about the Careers team at: www.careers.qmul.ac.uk

Graduate profile

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 College'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.

Graduate profiles

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 2011, including:

Accenture, Airbus, Balfour Beatty, Cancer Research UK, Carbon Trust, Citibank, Deloitte, IBM, KPMG, Ministry of Defence, NHS, PwC, Siemens, Sky and Unilever.

Destination of Leavers from Higher Education Survey 2011

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 available through the QM Temps Agency

• Easy access to hundreds of off-campus jobs across London via the QM JobOnline vacancy site

• 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 2011, on completing their course, Queen Mary postgraduates had an average salary of £35,410.

Destination of Leavers from Higher Education Survey 2011

Notable alumnus

Carl Murray

The astronomer Carl Murray is Professor of Mathematics and Astronomy at Queen Mary. 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 are ranked amongst the top 150 universities globally*.

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 – Autumn 2011-12).

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.

*The Thomson Reuters World University Rankings 2011-12

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 151-152 or visit www.qmul.ac.uk/international

Student profile:
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 with over 70 members of academic staff and 1,400 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

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 genetics, neurobiology, cognitive biology and psychology, behavioural ecology, aquatic and terrestrial ecology.

We benefit from strong collaborative links, both within the School and beyond, which provides additional insight and expertise. We have partnerships with other academic departments at Queen Mary, as well as external partnerships with universities, research institutes and industry.

Postgraduate resources

The School provides a friendly, interactive and lively environment for students undertaking MScs, PhD degrees and post-doctoral research. As a student here, you will also be able to take advantage of London's position as a major international centre for scientific meetings and conferences.

School of Biological and Chemical Sciences
www.sbcs.qmul.ac.uk

Our research resources include excellent library and information services; and a high-speed computer network that provides fast access to a wide range of databases and other electronic sources of information. The School currently has two high-performance computing (HPC) clusters, one Mac-based and one Linux-based. Further investment in modern HPCs is anticipated in tandem with an ongoing recruitment programme for academic staff with expertise in computational biology/chemistry. The Queen Mary Genome Centre provides further specialist resources for genomics and bioinformatics. Facilities for purification and analysis of macromolecules include 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), fluorescence spectroscopies and X-ray crystallography. Facilities for molecular biology include a phosphoimager, pulsed gel electrophoresis and a range of image stations, qPCR and in-situ PCR. State-of-the-art imaging facilities include confocal (two-photon) and EM microscopy, and an efficient and well-equipped chemical store. We also have glasshouses; controlled environment rooms; cold rooms; one of the largest CO_2 flux monitoring facilities in the UK; and marine and freshwater aquaria. Some of our academic staff are based at The River Laboratory (Dorset) and its research facilities are also available for use by our students.

In 2011/12 the School benefited from a £4.5m refurbishment of the Fogg Building (biology and psychology) and £1m investment in the Joseph Priestley building (chemistry and biochemistry) to build new research laboratories.

Research quality indicators

The Research Assessment Exercise
The School has high-calibre academic staff who generate a vibrant research culture and produce work that appears in high-impact multidisciplinary journals (for example *Nature* and *Science*) as well as leading specialist journals.

The results of the most recent Research Assessment Exercise 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, ESRC) 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).

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

Scholarships/studentships

PhD studentships
The School offers around 12 research studentships annually, which Home and some EU students are eligible to apply for. These are advertised at www.sbcs.qmul.ac.uk in November/December. Around half of these studentships are funded by the following research councils: NERC (www.nerc.ac.uk); EPSRC (www.epsrc.ac.uk); ESRC (www.esrc.ac.uk); BBSRC (www.bbsrc.ac.uk).

We also offer a number of Queen Mary Principal's Studentships, which Home, EU and International students are eligible to apply for. We also welcome international students supported by scholarships funded by a variety of agencies (eg China Scholarship Council).

MSc studentships and bursaries
Applicants to our MSc in Aquatic Ecology by Research are considered for a bursary to the value of Home fees only, funded by the Freshwater Biological Association. There are also scholarships specifically for international students worth £1,500 or £4,000 a year.

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

Further information

Postgraduate Admissions Officer
Tel: +44 (0)20 7882 5889
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
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 continue on 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.

Recent graduates from 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 at universities in the USA and New Zealand. Others 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.

Aquatic Ecology by Research

What skills and knowledge will you develop?

You will develop a range of skills and knowledge, including:

- A good understanding of modern ecological theory tempered to the aquatic environment under global change

- The ability to undertake habitat surveys using contemporary methods for physical and chemical assessments of aquatic ecosystems

- Knowledge of identification and survey techniques for organisms, and food web analysis

- Experimental design, data analysis, and oral and written reporting skills

- Transferable skills: independent research and team-working skills.

Where Aquatic Ecology by Research graduates work

Our graduates use their skills to join aquatic research projects at other institutions or to further their chances of competing for PhD research positions. For example, among our 2011 graduates, one has been employed as a Research Assistant on a two-month cruise to the NE Pacific to study oxygen minimum zones, while another has published their thesis in a high-impact journal and used their data as the starting point to compete for and win a prestigious fully funded PhD studentship from AXA. Around 30 per cent of our graduates go onto further research.

Our links with industry

A percentage of our research is funded directly by industry partners such as the Environment Agency or CEFAS, and there are opportunities to develop your research project with these partners.

Careers

Chemical Research

What skills and knowledge will you develop?
You will develop a range of skills and knowledge, including:

- Experiment design and computational study skills

- Knowledge of laboratory equipment and software

- Highly developed skills in interpreting results

- The ability to critically evaluate scientific literature

- Oral and written reporting skills

- Knowledge of recent developments and research techniques in your selected field of chemistry.

Where Chemical Research graduates work
Many graduates from this programme have gone on to do further research in the UK and abroad, including PhD positions at Queen Mary, Imperial College London, Oxford University, University College London and in North America. Other graduates have secured employment in industry and academia.

Specific examples of graduate destinations and roles include:

- Schlumberger, a leading global oil field services provider • Manager of a cosmetics company in China • Pharmaceutical industry in the USA • Analytical Chemist at South East Water • National Hellenic Research Foundation, Athens.

Our links with industry
- We have links with chemical enterprises of all sizes, including Astra-Zeneca, GlaxoSmithKlyne, Pfizer and Syngenta.

- Several PhD students in the School are supported by industry.

- Some members of staff in the School have set up spin-out companies (eg PhosphonicS).

Student profile:
Mark Stevenson, PhD Biology

"I chose Queen Mary for the both research project and the supervisor. My field is the application of geographic profiling to biological questions. Geographic profiling is a method, developed in criminology, to catch serial killers. There are no other groups in the world using this approach in ecology; as such the research project is truly unique and groundbreaking.

"My supervisor Steve Le Comber made an immediate impression and has continued to support me throughout my studies. He is there to help whenever there is confusion, yet allows me the freedom to pursue my own research directions and collaborations. The whole environment of Queen Mary is friendly, relaxed and open. Office doors are left open and there is a genuine sense of enthusiasm in the work produced by postgraduates. The lab group that I work with support each other, work together on key problems and have a good time doing it. In my experience very few students at other universities have enjoyed such a dynamic and collaborative working environment.

"Outside of my studies, I have been training in Chinese martial arts for over 13 years. I run the QM Kung Fu society; I also run my own business teaching private clients and classes around Greenwich. I have taught women's self-defence classes at the Students' Union here. The Union has supported me every step of the way in founding the Kung Fu society."

Degree programmes

MSc Aquatic Ecology by Research

One year full-time, two years part-time

Drawing on expertise from the schools of Biological and Chemical Sciences and Geography, this interdisciplinary programme will equip you with an in-depth knowledge of contemporary theory and state-of-the-art techniques in aquatic ecology.

Overview

We offer you a comprehensive training with a significant proportion of time spent on practical, 'hands-on' skills developed in the laboratory and the field. The taught element of the programme focuses on pressing issues in aquatic ecology associated with global change, such as nutrient enrichment, sediment transport, invasive species, and the ramifications of climate warming. You will develop all the skills necessary to undertake further academic or applied research through completion of an extended project, which is typically aligned to research taking place in the Aquatic Ecology Group. You will be encouraged to share your findings through publication in relevant journals.

Why study with us?

- Aquatic Ecology was listed as a research strength of the School of Biological and Chemical Sciences in the last Research Assessment Exercise (RAE 2008).

- We have a River Communities Group (based in Dorset) dedicated to the protection and sustainable management of freshwater ecosystems.

- You will be taught by, and work alongside, internationally renowned staff with a strong background in climate change and carbon cycling work.

- You will have the opportunity to join large, well-funded research projects with field sites both in the UK and overseas.

- You will have access to excellent facilities such as experimental pond and stream channel mesocosms, both here and at the Freshwater Biological Association's River Laboratory.

• We have strong collaborative links with industry, stakeholders and end-users of our research (eg the UK Environment Agency, CEFAS, and environmental consultancies).

Programme outline
Core modules
• Aquatic Ecosystems: Structure and Function • Aquatic Systems: Hydrological, Hydrochemical and Geomorphological Processes • Statistics for the Biosciences • Residential field-training course: an introduction to key field skills • Individual research project

Teaching and assessment
• The taught element incorporates formal lectures, workshops and seminars, as well as field days and follow-up lab practicals; it comprises 25 per cent of your final mark determined by continuous assessment in the form of lab reports, MCQs, data analyses, and oral presentations. You can expect around 20 hours of contact time per week.

• Your extended project makes up the remaining 75 per cent of your mark. You will be assessed on the following: a literature review and project plan (15 per cent), student contribution and work ethic (7.5 per cent), oral presentation (7.5 per cent) and a thesis written in the style of a manuscript to be submitted to a journal (45 per cent).

Entrance requirements
• Undergraduate degree (minimum upper second class honours or equivalent) 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.

Further information
Postgraduate Admissions Officer
Tel: +44 (0)20 7882 5889
email: sbcs-pgadmissions@qmul.ac.uk

For informal enquiries, please contact:
Dr Jonathan Grey
Tel: +44(0)20 7882 5688
email: j.grey@qmul.ac.uk

Student profile: Maaike Milligan, MSc Aquatic Ecology by Research

"Having studied at Queen Mary for my undergraduate degree I was already familiar with the welcoming atmosphere, the high standard of teaching and the internationally renowned research – I couldn't find anywhere that was more suited to my academic needs.

"I have a strong interest and passion for aquatic ecology and wanted to continue to explore the subject area by undertaking a more challenging course that had a more practical focus. The School of Biological and Chemical Sciences is part of a unique faculty that works together to provide a diverse range of research areas. As such, the teaching is excellent and in my experience, work is well supervised and the feedback thorough. The support from academics and other students at Queen Mary makes the experience enjoyable and rewarding.

"London is one of the best cities for postgraduate students, particularly those with an interest in science. I go along to many talks and social events throughout the year organised by the Zoological Society, Natural History Museum and Science Museum, to name a few. London is very much at the centre of cutting-edge science and attending Queen Mary places you right in the midst of it."

Degree programmes

MSc in Biomedical Sciences

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

This dynamic new programme will give you an in-depth understanding of the biomedical science that underpins healthcare and medicine in the Twenty First century.

Overview

On this programme, you will gain an understanding of the principles and practices of biomedical science, focussing on advances in research and diagnostics in haematology, clinical biochemistry, clinical microbiology and cellular pathology. You will learn about the pathologies behind a range of diseases, and how these are diagnosed and treated. A substantive research project with experienced researchers will equip you with the skills needed for a wide range of careers in the biomedical or clinical sciences, or for further study towards a biomedically-related PhD.

Programme outline

This programme is currently under development. For the most up-to-date information, visit: www.sbcs.qmul.ac.uk

Why study with us?

- You will be taught by internationally renowned experts in the four major areas of biomedical sciences and will equip you with a broad range of skills to enhance your employability.

- Our London location means that there are a wide range of organisations such as the Institute of Biomedical Sciences and the Institute of Biology nearby who regularly hold meetings that you can attend.

- Our links with Queen Mary's Barts and the London School of Medicine and Dentistry will keep you up to date with one of the UK's leading centres of medical research.

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

This programme gives you the opportunity to acquire key research skills while conducting a major individual project in your chosen area of chemistry. It will provide a comprehensive preparation for a research career in academia, as well as being a real asset if you wish to pursue alternative careers in industry or education.

Overview

You will receive training in a wide range of research techniques to enable you to build up a substantial profile of experimental skills so that you can tackle more extended research projects with confidence. Typically this includes hands-on use of instrumentation for nuclear magnetic resonance spectroscopy, chromatographic and vacuum systems, and the manipulation of air-sensitive materials. With help from an academic supervisor, you will choose an area of experimental or computational chemistry in which to conduct an individual research project. Practical experience is reinforced by two taught modules, designed to strengthen your knowledge and understanding of advanced topics, which you select from a range of options covering the major areas of modern chemistry.

Why study with us?

- Undertaking an in-depth individual research project, you will develop the skills necessary to investigate a new area of chemistry and present the results both verbally and in writing.

- The School of Biological and Chemical Sciences is large and diverse, providing an ideal environment for collaborative research,

for example at the chemistry/life sciences interface.

• You will work in modern, well-equipped laboratories. Our new Homogeneous Catalysis Laboratory and Laboratory of Physical and Theoretical Chemistry were opened in 2012.

• The School has strong links with a range of industrial companies.

Programme outline

Core module
Chemical research project (worth 150 credits)

Option modules
You will be able to choose from a wide range of option modules (each worth 15 credits). For example: Collidal Chemistry • Biological and Medicinal Inorganic Chemistry • Organic Synthesis • Cancer Chemotherapy

Teaching and assessment

• As well as regular meetings with your research project supervisor (typically about two hours per week) and training in the use of instruments needed for your particular project, you will attend workshops on academic writing. For laboratory-based research projects you will spend around 30 hours per week working alongside PhD students, technical and postdoctoral staff and will have many opportunities to learn skills from interacting with other researchers.

• Teaching for option modules includes lectures, workshops and a virtual learning environment. You can expect two to four hours of contact time per module, per week.

• Assessment of the research project module is on the basis of the following: dissertation (up to 30,000 words) • seminar presentation • oral examination • research supervisor's evaluation of the quality and quantity of work performed.

• Option modules are assessed through a combination of coursework, which is often based on sets of written problems, and written examinations in the early summer.

Student profile: Graziano Deidda, MSc in Chemical Research

"I chose to study in UK because I wanted to gain experience abroad and improve my skills in organic chemistry. I decided to come to Queen Mary because of the location and recommendations from people that had already attended. After talking to academic staff and postgraduate students at an open day last year, I was determined to enroll on this MSc.

"Since I started the masters, I have always been supported in a positive way. The College provides training in the use of laboratory equipment, interesting research seminars and free English language classes. When I have needed it, I have always received help from my lecturers and from staff belonging to other research groups. Many of the people in the lab come from different countries and cultures and it has been easy to make friends. We frequently meet up after working hours – I feel it is important to interact with people working in other areas of chemistry.

"Every day I can learn something new and I feel comfortable knowing that I am surrounded by helpful people. The course has served to put into practice the knowledge that I learned during my undergraduate studies. It focuses more on the application of theory and methods, and the transition has been an easy one, essentially because the environment at Queen Mary is right."

Degree programmes

Entrance requirements

- A second class honours degree (or international equivalent) with a significant chemistry component is the normal minimum requirement.

- Where English is not your first language, IELTS 6.5 is required. For more information on international entry requirements, see page 151 or visit www.qmul.ac.uk/international

Further information

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

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

MSc in Cognitive Science

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

This unique, interdisciplinary programme - including psychology, neuroscience, philosophy, linguistics, and artificial intelligence – will address fundamental questions relating to the human mind and behaviour in society, by considering evolutionary principles.

Overview

Taught modules will introduce you to the ultimate (evolutionary), proximate (genetic, developmental and neurobiological) and intermediate (cognition) mechanisms responsible for human cognition and behaviour. The research component of the course will introduce you to experimental design and formal tools (computational models) that the cognitive sciences use to uncover and describe human cognition and behaviour.

By the end of the programme you will be familiar with the key theories and techniques involved in cognitive science, including the core issues that underpin human behaviour such as conceptualising uncertainty, the formation of choices, and the conditions that enable control of our environment.

Programme outline

This programme is currently under development. For the most up-to-date information, visit: www.sbcs.qmul.ac.uk

Why study with us?

- Our programme is driven by a multidisciplinary approach, which offers you the unique opportunity to learn about a variety of different fields of study that are couched within evolutionary cognitive science.

- You will have the option to work with researchers in various Queen Mary departments (psychology, linguistics, computer science), as well as the London Business School.

- The programme will provide you with intellectual tools useful for careers in industry, management, media, and consultancy, or research in psychology and other cognitive sciences.

Further information

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

MSc in Ecology and Evolutionary Biology

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

This new and exciting programme will give you a scientific understanding of global ecological change, and provide you with the skills, tools and experience for tackling pressing environmental questions.

Overview

The programme will focus on concepts and theory essential to understanding global

ecological change, including state-of-the-art techniques for environmental process research, invasive species ecology, and conservation genetics. You will learn how to convert science to policy or management, and how to consult with stakeholders. You will spend time shadowing our multidisciplinary research teams before conducting a substantive six-month project. These projects may be jointly supervised by colleagues at related institutes or within industry. We will equip science graduates with the essential skills to proceed to further research via PhD or careers in consultancy and industry.

Programme outline
This programme is currently under development. For the most up-to-date information, visit: www.sbcs.qmul.ac.uk

Why study with us?
- With stakeholder engagement, we have developed modules accommodating pure research and applied practical skills developed to promote graduate employability.

- Dedicated field courses: in Africa for first-hand experience of theory in action; and in Dorset learning to convert science to policy with our River Communities Group.

- You will be taught by internationally recognised scientists who are leaders in their respective fields.

- You can attend scientific events and seminar series across London.

- Opportunities for projects in the UK and overseas, and in conjunction with collaborators such as the Institute of Zoology, Royal Botanic Gardens Kew, NERC Centre for Ecology and Hydrology, and the Natural History Museum.

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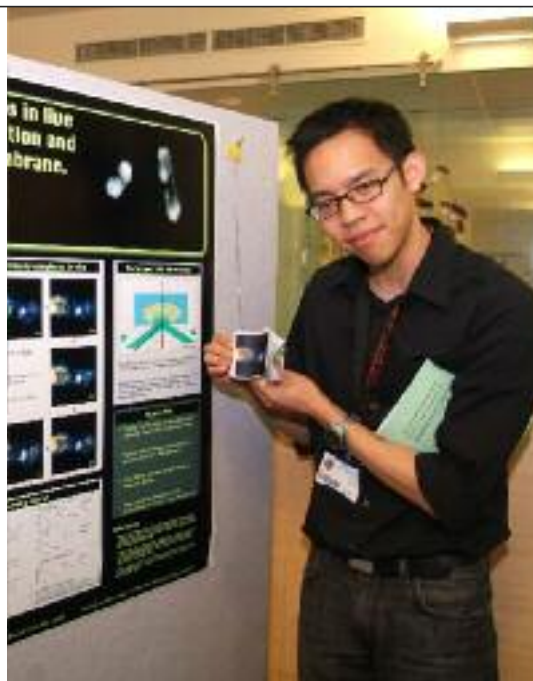
Graduate profile:
Yueng Tchern Lenn

Studied: PhD in Biochemistry, graduated in 2009

Currently: Postdoctoral Fellow at the Lawrence Berkeley National Laboratory and visiting researcher at UC Berkeley in Berkeley, California, USA

Why did you choose Queen Mary for your postgraduate study?
I was offered an excellent project for my PhD in a department that contained faculty from diverse disciplines that were obviously well regarded in their respective fields with an unpretentious but strong collegial feel. The small size of the department also suggested that I would be well supported rather than just being a number.

What did you gain from your time at Queen Mary?
I received excellent training, established a strong professional network and I remain very proud of my PhD work.

How has your career progressed since you graduated?
I have held postdoctoral positions at Imperial College, Queen Mary, UC Berkeley and been a visiting academic at Oxford University.

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 150.

Research areas

- **Chemistry and Biochemistry**
- **Cell and Molecular Biology**
- **Organismal Biology**
- **Psychology**

Chemistry and Biochemistry

This division has three main areas of research:

- Synthesis and Catalysis has seen a resurgence at Queen Mary 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, catalysts and as drug delivery vehicles; (iv) molecular machines for application in the synthesis of complex molecules and materials; and (v) the development of new sensor materials.

- Theoretical and Physical Chemistry research, often utilising the central facilities at the Rutherford Appleton Laboratory, includes: (i) ultrafast electron transfer; (ii) molecular simulation allied to muon spectroscopy and inelastic neutron scattering; (iii) neutron reflectometry at interfaces; and (iv) the synthesis and characterisation of solid state ionic materials.

- Chemical and Structural Biology research includes: (i) analysis of protein structure and structure/activity relationships in peptides, proteins and enzymes, utilising X-ray crystallography and NMR spectroscopy; and (ii) synthesis of biologically relevant molecular systems.

Cell and Molecular Biology

This is a time of enormous advances in molecular and cellular biology driven by curiosity, scientific skill, and advances in technology. In this division, we have research excellence in:

- Membrane protein structure and dynamics, especially in photosynthesis, light harvesting and bioenergetics. We are combining molecular biophysics, advanced optical fluorescence measurements and structural methods to understand photosynthetic processes at the cellular and molecular levels, including assembly and repair of the photosynthetic machinery within the photosynthetic membrane. This research has profound implications for bioenergy.

- Biomedical research, in particular the processes of ubiquitination, epigenetics, infection, and trypanosomal diseases. Ubiquitin labelling regulates the cell cycle, the response to infection, and protein degradation and errors in ubiquitin labelling can result in cancer. Epigenetic changes in patterns of histone protein modification can also cause cancer as well as other diseases. Our biomedical research also underpins drug discovery, for example in development of new strategies for control of trypanosomal diseases.

Organismal Biology

In this division, we have unparalleled strengths in:

- Aquatic ecology including, population and community ecology, food web structure and function, and greenhouse gas production, all underpinned by impressive capital infrastructure; this includes one of the largest CO_2 flux monitoring facilities in the UK. The impact of environmental change on ecosystems and biological resources is an important and growing area of research.

Research areas

- Evolution and genetics – our cutting-edge research in this area, utilising genomic markers and next-generation sequencing technologies to investigate genome and gene divergence, represents a significant internationally recognised contribution to the understanding of the mechanisms and consequences of speciation and hybridisation. This work has relevance to food security, biodiversity and ecosystem functioning.

- Research on ecological aspects of parasites and infectious diseases – this work complements research on disease-causing agents in the cell and molecular biology division.

- Neurobiology and developmental biology – utilising vertebrate and invertebrate model systems, we research the evolution and development of neural systems, and the molecular and cellular mechanisms underlying changes in animal behaviour in response to environmental factors such as light, temperature and drugs, complementing and bridging with comparative/evolutionary research on animal/human behaviour in the psychology division.

Psychology

Research in this area focuses on the ultimate (evolutionary) and proximate (genetic, developmental and neurobiological) mechanisms responsible for the psychology of humans as animals, specifically their decision-making, cognition, communication and behaviour. A central consideration for this group concerns cognitive evolution and the biological basis of human social behaviour. We 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 include physical reasoning and social cognition in corvids, colour perception in insects, 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 signaling molecules 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. We also study the communication of domestic animals, as well as their psychological welfare.

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

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 signaling 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 the role of calcium signaling during development

Richard Buggs BSc(Cantab) DPhil(Oxon)
NERC Fellow
Mechanisms of evolution

Gregory Chass BSc (Toronto, Canada), PhD (Szeged, Hungary)
Reader in Physical and Theoretical Chemistry
Synthetic Chemistry, Computational Chemistry

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 signaling molecules

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

Matthew Evans BSc(Bristol) PhD(Cantab)
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 co-operatively breeding mammals

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(Lond)
Royal Society Research Fellow, Lecturer
Organic synthesis and methodology; molecular nanotechnology; physical organic chemistry

Jonathan Grey BSc PhD(Lanc)
Senior Lecturer in Freshwater Biology
Alternative resources fuelling aquatic food webs, the effects of invasive species, hind-casting, and cross ecosystem boundary linkages

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(Saton)
Senior Lecturer in Marine Biology
Biological oceanography, marine zooplankton ecology

Staff profile:
Dr Igor Larrosa

Senior Lecturer in Synthetic Organic Chemistry

"Our work is in an area called 'C-H activation' which aims at developing a completely new way of making the molecules that can be found in medicines, living tissues and organic materials such as OLEDs. Instead of using the conventional synthetic tools, which often involve environmentally unfriendly approaches (producing too much waste, requiring too much energy and/or using difficult-to-obtain materials), our research aims at building molecules from simple, readily available materials, just by replacing the ubiquitous hydrogens (H) found in all organic molecules, with other groups of atoms bearing the desired functionalities.

"Many areas in science depend on chemistry to provide novel molecules to develop medicines, materials, or to further understand how cells work at the molecular level. Therefore, to accelerate advances in those areas, we need to be able to make molecules easily. In the long run, this research could lead to scientists having access to any molecules they could imagine or need for their own research. These molecules could be made in hours instead of years, and be easily prepared by automated computer-controlled machines.

"With a very high proportion of young and ambitious academic staff, Queen Mary provides a very exciting atmosphere for carrying out postgraduate studies. The staff profile results in lots of interactions being possible between students and academics from different backgrounds, which invariably leads to the generation of novel ideas to develop exciting research projects."

Research areas

Rob Hughes BSc(Wales) PhD(Reading)
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, DNA methylation, histone modifications, post-translational modifications

Thomas Ings BSc(Exon) MRes(York) PhD(Lond)
Leverhulme Early Career Fellow
Pollinator behaviour, predator-prey interactions and invertebrate community ecology and conservation

Bob Janes BSc MSc PhD(London)
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

Jeremy Kilburn BSc PhD(Cantab)
Vice-Principal and Executive Dean (Science and Engineering)
Organic synthesis, supramolecular chemistry, high through-put electrochemistry

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
wateroxidising photosynthesis; phytochromes

Igor Larrosa BSc MRes PhD(Barcelona)
Lecturer in Synthetic Organic Chemistry
Gold and palladium homogeneous catalysis,
C-H activation

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 modeling; mathematical
approaches to animal foraging

Andrew Leitch BSc PhD(Brist)
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(Aberdeen)
PhD(Manchester)
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

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, Lecturer in
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(Sus) PhD(Lond)
Lecturer in Experimental Cognitive Psychology
Mechanisms involved in learning, decision
making, and problem solving in complex
dynamic environments

Bernardeta Parkin BSc PhD(Imperial) CChem,
MRSC
Lecturer
Organometallic compounds

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

Sujith Puthiyaveetil
Leverhulme Early Career Fellow
Signalling and gene regulation by chloroplast two-component systems

Qazi Rahman BSc(Staff) 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(Brist)
Royal Society University Research Fellow, Senior Lecturer
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

Tippu Sheriff BSc PhD CChem MRSC DIC
Lecturer
The Synthesis and Characterisation of Novel Manganese Complexes of Biological Interest

Peter Skorupski BSc(St Andrews) PhD(Brist)
Lecturer in Neurobiology
Calcium potentials in crayfish neurons

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

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

Matthew Struebig PhD(Lond)
Leverhulme Early Career Fellow
Disturbed habitats of Southeast Asia

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

James Sullivan BSc(Leicester) 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(Brist) PhD(Lond)
Reader 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 Andrewa) PhD(UMIST)
CChem MRSC
Professor of Synthetic Chemistry
Custom design and synthesis of novel
functional ligand systems

Robin Whelpton PhD CChem MRSC
Senior Lecturer
Development and application of analytical
methods for the determination of bioactive
agents, drugs and other xenobiotic compounds
and pharmacokinetic

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

Dr Yannick Wurm Engineering Degree
(INSA Lyon) PhD(Laussane, Switzerland)
Lecturer in Bioinformatics/Phylogenetics
Ant Genomics and Evolution

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(Sheffield)
MIOP
Lecturer in Physical Chemistry
Structural studies of biological and polymeric
systems at buried fluid-fluid interfaces

Electronic Engineering and Computer Science

The School of Electronic Engineering and Computer Science is one of the top 20 departments in the UK for studying computer science and electronic engineering. Our outstanding resources include our state-of-the-art listening room and laboratories in antennas and augmented human interaction. We have more than 240 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 focus on creating long-lasting contributions that apply to real-world problems.

We have strong links with industrial partners and academic colleagues around the world, in a variety of sectors and disciplines, delivering core developments and novel technologies which leave a lasting impact on society and the world we live in.

Our research has left indelible marks in areas as diverse as video coding; counting and recognition of human behaviour in public space CCTV; weather satellite antennas; human perceived performance of network-delivered software applications; network analysis and measurement; the design of state-of-the-art antennas; mathematical techniques for risk management in areas such as medical, legal and financial environments; next-generation sampling drum machine software;

and understanding the intense interaction between jazz musicians as they improvise. All of our MSc programmes are aligned to one or more research groups, which means that whichever course you choose you will be taught by research leaders in the relevant field.

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, climate controlled, award-winning informatics teaching laboratory (ITL) outside of scheduled laboratory sessions. The ITL hosts over 250 state-of-the-art PCs capable of multimedia production and several laser printers. In addition, there are video conference facilities, seminar rooms, and on-site teaching services and technical support. There are also a number of breakout spaces available to students with full wi-fi access allowing you use your own mobile devices.

The ITL is primarily used for taught laboratory sessions and regularly hosts research workshops and drop-in lab facilities. 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; telecommunication networks; and microwave antennas. In addition to these spaces, PhD students have generous study space in our research laboratories. In 2011 we completed the £2m development of new experimental facilities in Antennas and Media and Arts Technology. We formed the Interdisciplinary Informatics Hub in Collaboration with the Schools of Biological and Chemical Sciences and Mathematical Sciences. These laboratories provided a meeting place for postgraduates from the three Schools to interact and exchange ideas.

Research quality indicators

The Research Assessment Exercise
We had excellent results in the most recent Research Assessment Exercise (RAE 2008). We submitted 80 per cent of academic staff in Computer Science and 75 per cent of their research output was rated three or four star. 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 £37m. We have interdisciplinary collaborations with: biologists (to decode genome data and understand cell-deformation); chemists (to develop radio frequency assisted chemistry); musicians and actors (to produce more creative forms of music and performance); mathematicians (to develop theories of network traffic); medical researchers (to design new monitoring techniques and decision-making strategies); and lawyers (to find ways to simplify risk and probability to juries).

In conjunction with colleagues from other academic institutions we have received two EPSRC Programme Grants worth over £10m. We have a £3m EPSRC Knowledge Transfer project, ImpactQM, which links early career researchers with industry partners and our £6m EPSRC National Doctoral Training Centre in Media Arts and Technology is in its third year.

Scholarships/studentships

MSc scholarships
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.

International Science and Engineering Excellence Awards
We are pleased to offer International Science and Engineering Excellence Awards to the value of £1,500 or £4,000 per year. These awards are designed to reward excellent academic achievement and attract the brightest and best students from overseas.
www.qmul.ac.uk/international/scholarships

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, 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 before January 31st. 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.

China Scholarship Council (CSC)/Queen Mary Joint PhD scholarships

Queen Mary is pleased to be able to offer a limited number of joint PhD scholarships in collaboration with the China Scholarship Council (CSC).

Under this scheme Queen Mary provides a scholarship to cover all tuition fees, and the CSC provides living expenses and one return flight ticket to successful applicants.

The scholarships are valid for the duration of the PhD programme at Queen Mary.

For further information, see:
www.qmul.ac.uk/international/scholarships

For the latest information regarding our scholarships please visit www.eecs.qmul.ac.uk/phd or contact our Research Students Co-ordinator.

Why study here?

Awards recognising our teaching and research excellence include:

- Nine members of staff hold prestigious awards for teaching from bodies including the Engineering and Physical Sciences Research Council, Royal Academy of Engineering, Royal Society and the European Research Council.

- Winner of 2011 Cathay Pacific China Business Awards in the 'New Horizons' category – an awards scheme to celebrate UK business success in Hong Kong and China.

- Professor of Computer Science, Ursula Martin was awarded a CBE for 'Services to Computer Science' in the 2012 Queen's New Year's Honours List.

- Professor Peter McOwan was awarded the 2011 Mountbatten Media Award for excellence in communicating computer science to diverse audiences.

Further information

Postgraduate Administrator
Rupal Vaja
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Research Students Co-ordinator
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Dr Tony Stockman
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General postgraduate information
Tel: +44 (0)20 7882 7952/7840
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International students
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Graduate Admissions Office
Queen Mary, University of London
London E1 4NS
Tel: +44 (0)20 7882 5533
email: admissions-teama@qmul.ac.uk

Careers

The world of electronics, communications, media technologies and computing offers challenging, creative, and well-paid careers in a variety of industries and sectors. There is currently a shortage of highly qualified graduates in the fields of computer science and electronic engineering, meaning that there are lots of exciting career opportunities for graduates with the right skills.

You may wish to work 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 you may be able to move 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, University of Glasgow, and here at Queen Mary.

What skills and knowledge will you develop?
Programmes offered by the School develop a range of skills including:

- logical, critical thinking and problem solving skills
- communication and presentation skills
- project management and implementation skills
- risk assessment skills
- leadership and professional skills
- high-level programming skills.

Our links with industry
Over the years we have worked to develop strong links with industry through collaborations, partnerships, student industrial placement schemes and public engagement programmes. Some of our current partners include Vodafone, IBM, BT, NASA and Microsoft Research.

In recent years, the School has been the home to a number of original ideas which have subsequently become successful spin-out companies. These include:

- QApps (www.qappsonline.com) – provides smartphone and social networking apps developed by students and staff. (Est. 2011)
- Chatterbox (www.chatterbox.co) – provides unique conversation analytics software to monitor discussions about brand-related issues on social media. (Est. 2011)
- Agena Ltd (www.agena.co.uk) – provides risk management software for business systems and a range of major clients including Philips and Motorola.
- Vision Semantics Ltd – develops software to manage facilities and enhance security.
- Actual Experience Ltd (www.actualexperience.com) – a software-based service that quantifies and diagnoses perceived application experience.

Where do our graduates work?

Computing and Information Systems
Graduates typically find roles in the development of real-time embedded systems, web development, search engine development and evaluation and document database development and administration. Specific examples of roles our graduates have obtained include: security analyst; educational systems developer; web developer; database developer; systems analyst; and financial systems developer. Employers of our graduates include: Accenture; BT; Camelspace; Datang Microelectronics Technology; Hellagro; Kaplan Financial; KPMG; Lancaster University; Melli Bank Place; and Pacific World Ltd (Thailand).

Computer Science
Graduates typically find roles in the areas of advanced programming, software development and support, software engineering, product designer and development, systems analysis, interface and interaction design, and database development.

Digital Music Processing
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. Recent graduate destinations include: Creative labs; FXpansion; Sonnox; Sonalksis; Intrasonics; EMI; Calrec Audio; and Rockstar Games, among others.

Digital Signal Processing (DSP)
The rapid advancements in the technology and dependence on DSP means that employment options are broad. Our graduates typically find opportunities in conventional electronics and telecommunications companies; the creative media; professional audio companies; healthcare; digital image processing; automotive industry; biomedical industries; and research and development.

Software Engineering
Our graduates are qualified to work in software development or database technology in a wide variety of sectors, including computer games design in the entertainment sector, database design in the financial sector, or in any number of computing-based roles in the public and private sectors. Typical jobs include: security analyst, social network analyst, software risk analyst, system designer, software engineer, programmer, usability consultant, and software architect.

Telecommunication Systems
Graduates will develop an in-depth knowledge of converged, all-packet communications networking; an understanding of the mathematics and science that underpins communications networking; Java programming for network and services design; and the ability to apply probabilistic methods to evaluate the performance of networks. Graduates roles typically include: network engineer; telecommunications system specialist; mobile control consultant; communications engineer. Employers of our graduates include: China Mobile, Nokia-Siemens China, orange labs, Bank of America Merrill Lynch, and Bell Labs Ireland and UK.

Mobile and Wireless Networks
Graduates will develop an in-depth knowledge of mobile and wireless communications; an understanding of the science that underpins wireless communications, including an understanding of the physical medium through which information flows; and exposure to the developing fields of sensor networks and the internet of things. Examples of recent graduate destinations include: Airwide Solutions; King's College London; Motorola (China) Technologies Ltd; Schlumberger and Wateen Telecom.

Degree programmes

MSc Computing and Information Systems (generalist)

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

Graduates who are able to fully exploit the potential of computing and information systems within a range industries, including retail, manufacturing, health, and communications are highly sought after. If you are looking to enhance your employability and develop your skills in this area, but have little or no technical experience, then this programme is for you.

Overview
Guided by academics with a wealth of industrial experience, this programme develops your knowledge and practical technical development skills by providing extensive training in the subjects at the heart of computing, including object-oriented programming (using Java), database systems, and information systems (covering system design, networking and computer architecture). You will be able to extend your areas of technical expertise to specialist areas by choosing from a variety of option modules, such as Mobile Devices and Social Networks, Business Technology Strategy and Graphical User Interface Design.

Why study with us?
- This intensive one-year conversion programme is designed for students without a technical background in IT, but who want to pursue a career in computing.

- You can personalise your programme to follow a technical or business focus, developing practical and theoretical skills which will be highly relevant in today's job market.

- This programme is reviewed and approved by a panel of industrial experts to ensure that it is up to date and relevant to the computing sector.

Programme outline
Core modules
• Database Systems • Java Programming (double module) • Information Systems (double module) • MSc Project

Option modules include
• Network Programming • Graphical User Interface Design • Mobile Devices and Social Networks • Entrepreneurship in Information Technology • Network Planning, Finance and Management • Interaction Design • Decision and Risk • Business Technology Strategy

Teaching and assessment
• Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by labs and directed further study.

• Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

• This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see:
www.eecs.qmul.ac.uk/postgraduates/distance-learning

Entry requirements
• A good second class honours degree or equivalent 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 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 whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Graduate profile: Samuel Pachoud

Studied: PhD Computer Science

Currently: Management Consultant at Ernst & Young

Why did you choose Queen Mary?
In 2005, I worked as a guest research student in Queen Mary's Multimedia and Vision group in the area of clustering and behaviours analysis. At the end of the six-month project, my supervisor at Queen Mary offered me a joint PhD position. The quality of the facilities, the campus location and the friends I had made convinced me to take up the offer.

What did you gain from your time at Queen Mary?
I had a great time and made numerous friends, among both fellow students and staff. I also gained lots of transferable skills, thanks to the different responsibilities and extracurricular activities that Queen Mary offers.

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. I would like to reach managerial level where I will have the opportunity to supervise people and take on more responsibilities.

Degree programmes

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

MSc Computer Science

One year full-time, two years part-time

The demand for better products and commercial services drives the search for creative solutions using computing-based systems, and has established a critical dependence between computing and practically every industry and sector. This flexible programme offers a broad range of advanced study options reflecting the emerging technologies in industry.

Overview
You will be able to shape your programme to match your interests and career ambitions, choosing modules from a range of areas, including the development of human-computer communications (dialogue systems), ubiquitous computing, applying interactive digital multimedia techniques, security and surveillance, and building decision-support tools for uncertain problems in various contexts (eg legal, medical, safety). This is a multidisciplinary programme and, in addition to pure computer science modules, you may choose options in which computer science intersects with other fields.

Why study with us?
- You can personalise your programme through a wide range of employment-relevant module choices.

- We have excellent links with industry, working together on commercial and research projects.

- Nine members of staff hold prestigious awards for teaching from bodies including the Engineering and Physical Sciences Research Council, Royal Academy of Engineering, Royal Society and the European Research Council.

- This programme is reviewed and approved by a panel of industrial experts to ensure that it is up to date and relevant to the computing sector.

Programme outline
Core modules
MSc Project

Options modules
Advanced Programme Design • Computer Vision and Neural Networks • Computer Vision Systems • Information Retrieval • The Semantic Web • XML and Structured Documents • Business Technology Strategy • Decision and Risk • Design for Human Interaction • Functional Programming • Interactive System Design • Internet Computing • Machine Learning • Mobile Services • Program Specifications • Real-Time and Critical Systems • Security and Authentication • Software Analysis and Verification • Advanced Database Systems • High Performance Computing

Teaching and assessment
- Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

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. Unrelated degrees will be considered if there is evidence of significant industrial experience.

• For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
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MSc in Computer Vision

**One year full-time
(Subject to approval)**

What if your smartphone could recognise that it was you before switching on, and could sense your mood by recognising your facial expressions? What if you could use a real thumbs-up for 'liking' things on Facebook? How can you play games on an Xbox using only your body gestures? How can you equip cars with in-vehicle technology that could automatically read road signs? These are just some of the fascinating questions that you will strive to answer on this programme.

Overview
This programme is intended to respond to a growing skills shortage in research and industry for engineers with a high level of training in the analysis and interpretation of images and video. It covers both low-level image processing and high-level interpretation using state-of-the-art machine learning methodologies. In addition, it offers high-level training in programming languages, tools and methods that are necessary for the design and implementation of practical computer vision systems.

Why study with us?
• With more than 100 researchers we are one the largest groups in the UK in the field of computer vision. You will be taught by world-

Student Profile: Jayashree Sathyanarayanan, MSc Software Engineering

"When I considered Queen Mary as a postgraduate option, I found that it had a good ranking and was known as one of the best universities in London. The programme I was interested in also offered modules I was interested in. Many of the subjects are really practical and the modules encourage creative thinking. It has also given me a fresh perspective on many new concepts.

"I can approach staff whenever I have doubts and they always encourage individual development. My project supervisor is very kind and encouraged me in every step of my dissertation. He is very patient and has even included me in a research group for PhD students. This helps and accelerates knowledge transfer and gives me an insight about other people's research interests."

Degree programmes

class researchers in the fields of multimedia analysis, vision-based surveillance, structure from motion and human motion analysis.

- Aside from your lectures, you will be working on cutting-edge, live research projects, gaining hands-on experience.

- You will be provided with the skills and knowledge that will prepare you for a career either in industry or in further research.

Programme outline
Core modules
Machine Learning • Advanced Transforms • Computer Graphics • Computer Vision and Neural Nets • C++ for Image Processing • Techniques in Computer Vision • Artificial Intelligence • High Performance Computing • MSc project

Teaching and assessment
- All modules are taught through a combination of lectures and practical lab work. You can expect two to three hours of contact time per module, per week.

- All modules are examined through a combination of coursework and written examinations. You will also be assessed on your individual project.

Entry requirements
- A good second class honours or above in computer science, electronic engineering, maths, physics or a related discipline.

- You should have good knowledge of computer programming, including programming using C/C++, Python, Matlab or Java.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Student Profile: 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 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 school is particularly friendly to students.

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

Further information
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 by distance learning

This MSc equips you with hands-on experience and theoretical knowledge of the latest signal processing techniques, essential to recording, mixing, mastering, playback, analysis and processing of digital music. You will become an expert in today's digital music technology, as well as acquiring the skills needed to lead the development of the technologies of the future.

Overview
Developed by the acclaimed Centre for digital music (C4DM), this programme offers you a broad range of study options in methods of processing, analysis, synthesis and manipulation of musical signals. You will develop the knowledge and skills required for careers in the technical aspects of audio production, sound engineering, and broadcasting, acquiring an in-depth understanding of data analysis and signal processing techniques relating to human speech and hearing, psychoacoustics and masking, and instrument and room acoustics. You will also acquire an understanding of the design and development process for recording/processing/replay equipment for the home/studio/live performance environment.

Why study with us?
- C4DM has over 50 full-time members and since 2001 has become one of the UK's leading Digital Music research groups.

- You will be able to shape your own programme; by focusing on signal processing, you delve further into techniques used for processing, analysis and synthesis; by focusing on multimedia options you will gain a more general understanding of how music processing is performed in broadcasting systems and in relation to other media. This option also emphasises many of technical issues currently of concern to industry, such as watermarking, the 'loudness wars' and internet streaming.

- We have excellent connections with the music and entertainment industries; many members of the C4DM community are active musicians involved in several different aspects of the music and digital industry network.

- We run a series of lively and stimulating interactive art installations under the banner C4DM Presents (http://c4dmpresents.org), run a research seminar series presented by leading experts from other universities and industry, and have a Live Music Lab website.

Programme outline
Core modules
Advanced Transform Methods • Digital Audio Effects • Fundamentals of DSP • Machine Learning • Music Analysis and Synthesis • Music and Speech Processing

Option modules
Business Technology Strategy • Computer Vision and Neural Networks • Design for Human Interaction • Interactive System Design • Mobile and WLAN Technologies • Real-Time DSP • Sensors and Internet of Things

Teaching and assessment
- Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

Degree programmes

- This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see: www.eecs.qmul.ac.uk/postgraduates/distance-learning

Entry requirements

- A good second class honours degree in electronic engineering, computer science, mathematics, or a related discipline.

- You should have programming experience from your undergraduate degree.

- Unrelated degrees will be considered if there is evidence of significant industrial experience.

- You should also have completed an undergraduate programme in at least one of the following areas: signal processing, control, or analogue filters.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
Rupal Vaja, Postgraduate Administrator
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MSc Digital Signal Processing

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

This programme was designed in response to a growing skills shortage in industry of engineers with a high level of training in digital signal processing, a technology which is vital to the support of the internet, multimedia, broadcast, communications and consumer industries.

Overview
From facilitating the growth of digital communication systems to healthcare scanning applications, digital signal processing (DSP) underpins many of today's technologies. On this programme you will develop core knowledge of basic DSP theory and its implementation in hardware. You will also be able to specialise in areas including multimedia and intelligent signal processing. The taught modules are fully supported with computing and laboratory work. This MSc is designed for graduates in a related discipline, who wish to enhance their skills in this area, and also for those working in the IT sector with some experience of working with signal processing, who wish to consolidate their knowledge with a formal qualification.

Why study with us?
- The Centre for Digital Music (C4DM) is one of the leading multidisciplinary research groups in the field of music and audio technology.

- The rapid advancements in and dependence on DSP means that employment options are broad, and enhanced by our degree's accreditation. You will be well placed to find work in conventional electronics and telecommunications companies needing expertise in this field, or in the creative media industry.

- You will have access to our state-of-the art research and laboratory facilities, which include a listening room; antenna measurement laboratory; augmented human interaction laboratory, and media arts and technology studios designed to facilitate many different types of sound, music and performance research.

Programme outline
Core modules
• Advanced Transform Methods • Fundamentals of DSP • Machine Learning • Real-Time DSP

Option modules:
• Business Technology Strategy • Computer Vision and Neural Networks • Design for Human Interaction • Digital Audio Effects • Interactive System Design • Mobile and WLAN Technologies • Music and Speech Processing • Sensors and Internet of Things

Teaching and Assessment
- Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

- This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see: www.eecs.qmul.ac.uk/postgraduates/distance-learning

Entry requirements
- A good second class degree in electronic engineering, computer science, mathematics, physics or a related discipline, with some programming experience.

- Unrelated degrees will be considered if there is evidence of significant industrial experience.

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 of 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.

Student Profile: Fizzah Mubasher
MSc Telecommunications

"Queen Mary is a good place to study in terms of academic excellence, great in terms of innovation, and impressive with its academic and study facilities.

"I decided to come to Queen Mary for my MSc because my relative's son studied here and he really liked the university and is quite successful now. The best thing about my programme was that all of the modules were quite related and interesting. To top that off, I was lucky to get good teachers and all the modules had recorded lectures so I could re-listen to them when I revised. The Multimedia Systems coursework was one of the most interesting parts of the programme. We learned many things about software and the work was tough and challenging but, along with that, it was very interesting too. I live on campus, which makes going to the lab or department a short walk across campus. Library and lab facilities are accessible to the students most of the time – especially when you live on campus – and there are many extracurricular activities to become involved with. The halls are a great place to meet people and I've enjoyed hanging out with my flatmates at Hatton House.

"My favourite places on campus are the outdoor areas: in the West Square in front of the ITL and the picnic tables outside of The Curve. I've enjoyed my programme enough that I have applied for PhD study here! If I have the opportunity to do so, I would like to pursue my career in research and teaching."

Degree programmes

- You should also have completed an undergraduate programme in at least one of the following areas: signal processing, control, or analogue filters.
- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
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MSc Software Engineering

One year full-time, two years part-time

Whether it's the computers in our offices, the smartphones in our pockets, the electrics in our cars or the technology that enables us to monitor patients in critical care, software is at the heart of our society. This MSc programme focuses on advanced theoretical and practical techniques in program design, and the management of software project risk.

Overview
You will learn advanced techniques in program design (including software patterns and component technologies) and information handling (structured information and databases). You will also cover vital areas such as security, specification, risk management, usability, and design integrity. 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 study the mathematical foundations of software and their use in practice. You will develop skills to manage software project risks and learn about the development of tools to support decision-making.

Why study with us?

- The School of Electronic Engineering and Computer Science is internationally recognised for our pioneering and groundbreaking research, and innovative public engagement programme.

- The programme will enable you pursue roles in areas such as software design and engineering, web development, project management and IT consulting.

- Nine members of staff hold prestigious awards for teaching from bodies including the Engineering and Physical Sciences Research Council, Royal Academy of Engineering, Royal Society and the European Research Council.

Programme outline

Core modules:

• Interactive System Design • Design for Human Interaction • Functional Programming • Real-time and Critical Systems • Program Specification • Software Analysis and Verification Programs • Decision and Risk

Option modules:

• Advanced Program Design • Advanced Database Systems and Technology • XML and Structured Information • Machine Learning Internet Computing • High Performance Computing • Mobile Services • Security and Authentication • The Semantic Web • Business Technology Strategy

Teaching and assessment

- Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

- This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see: www.eecs.qmul.ac.uk/dl

Entry requirements

- A good second class degree 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. Unrelated degrees will be considered if there is evidence of significant industrial experience.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information

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Degree programmes

MSc Telecommunication Systems

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

This new programme responds to the rapid developments in telecommunication systems, such as social networking; seamless mobility; mobile data and the proliferation of applications for mobile and handheld devices. It will educate the next generation of network engineers in the fundamental science, mathematics and key technologies that underpin global networking.

Overview
The internet has developed at an astounding rate, connecting people in ways that we could never have imagined. On this programme you will study the advanced communications theory that underpins the science of networking, focusing on physical layer network communications, information theory and coding. You will develop hands-on experience in the Java programming foundations for network and services design, gaining an in-depth understanding of the technological foundations of converged, all-packet networks, and current mobile networks from WCDMA 3G to LTE and LTE-Advanced. You will also be able to analyse and evaluate how different infrastructures and designs affect commercial decisions.

Why study with us?
- Our staff are international experts in the fields of converged all-IP networks, modelling, measurements and quality of experience, and wireless technologies.

- You will have access to our state-of-the art research and laboratory facilities, which include an antenna measurement laboratory; and interdisciplinary informatics hub. You will also have access to licensed software tools (eg MATLAB, LABVIEW, OPNET) and to commercial network operating systems.

- You will develop an in-depth understanding of 21st Century networks, current mobile and WLAN technologies, software for network and services design, network modeling, sensors, the internet of things, security and authentication, and next generation mobile technologies.

Programme outline
Core modules
- Communications Theory • 21st Century Networks • Existing Mobile and WLAN Technologies • Software for Network and Services Design

Option modules include
- Security and Authentication • Sensors and Internet of Things • Business Technology Strategy • Internet Computing • Network Modelling and Performance • Mobile Services

Teaching and assessment
- Teaching for modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by labs and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

- This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see: www.eecs.qmul.ac.uk/postgraduates/distance-learning

Entry requirements
- A good second class degree or equivalent in electrical engineering, computer science, mathematics, or a related discipline.

- Unrelated degrees will be considered if substantial relevant industrial experience is shown.

• For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
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MSc Mobile and Wireless Networks

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

Globally, the explosion of data services and applications has created huge growth in the mobile and wireless communications industries. This new MSc is designed to educate a new generation of network engineers in the fundamental science and key technologies that have made this growth possible, and will sustain it into the future.

Overview
On this new programme you will study the theory that underpins the science of wireless communications. The programme will introduce you to mobile networks from WCDMA 3G to LTE and LTE-Advanced, examining how mobile and wireless fit into the spectrum of 21st Century communications. At the end of the programme you will be equipped with the skills needed for a wide range of jobs in the expanding mobile telecommunications industry, particularly in the areas of wireless equipment manufacture and operation.

Why study with us?
• This programme is accredited by the Institute of Engineering and Technology.

• Our staff are international experts in the fields of converged all-IP networks, modelling, measurements and quality of experience, and wireless technologies.

Student Profile: 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 are also very helpful. They've allowed me to broaden my skills in a variety of areas while completing my PhD."

Degree programmes

- You will have access to our state-of-the art research and laboratory facilities; antenna measurement laboratory; and interdisciplinary informatics hub. You will also have access to licensed software tools (eg MATLAB, LABVIEW, OPNET) and to commercial network operating systems.

Programme outline
Core modules
• Communication Theory • Mobile and WLAN Technologies • 21st Century Networks • Radio Wave Propagation • Next Generation Mobile

Module options include
• Sensors and Internet of Things • Antennas for Mobile Applications • Network Modelling and Performance • Mobile Services • Business Technology Strategy

Teaching and assessment
- Teaching for all modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by labs and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

- This programme is also available as a distance learning and part-time option, allowing you to study at your own pace. For more information, see:
www.eecs.qmul.ac.uk/postgraduates/distance-learning

Entry requirements
- A good second class degree or equivalent in electrical engineering, computer science, mathematics, or a related discipline.

- Unrelated degrees will be considered if substantial relevant industrial experience is shown.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
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MSc by Research in Computer Science

One year full-time, two years part-time

This MSc involves an extended individual research project carried out as part of one of our established research groups, combined with selected taught modules.

Overview
This 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 (IMC); Risk Information Management (RIM); and Computer Science Theory. It 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 position in industry.

Why study with us?
- We are internationally recognised for our pioneering and groundbreaking research, and innovative public engagement programme. You will develop advanced technical and independent research skills.

- You will have access to our state-of-the art research and laboratory facilities, which include a listening room; antenna

measurement laboratory; augmented human interaction laboratory and interdisciplinary informatics hub.

Programme outline

- You will join one of our research groups, taking four selected taught modules and completing an extended research project.

- You can choose four taught modules from any of the modules offered in the School, in line with what is most appropriate for the chosen research project.

Teaching and assessment

- Teaching for all modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

- The MSc Research Project will be conducted under close supervision throughout the academic year, and is evaluated by thesis, presentation and viva examination.

Entry requirements

- In your application you should identify the research group relevant to your proposed study. Offers are subject to the agreement of a suitable research proposal.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information

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MSc by Research in Electronic Engineering

One year full-time

On this programme you will use theoretical and experimental research techniques to explore and create innovative state-of-the-art technologies, enabling you to transfer your knowledge for practical application in the future.

Overview

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 will publish at least one conference paper as part of their research. You will develop excellent technical skills, and will be able to demonstrate to employers your ability to undertake high-level independent research. 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); and Networks.

Why study with us?

- Our staff are international experts in the fields of converged all-IP networks, including modelling, measurements and quality of experience, and wireless technologies; antennas and electromagnetics, including healthcare applications; computer vision and image processing, including watermarking and data compression.

- You will have access to our state-of-the art research and laboratory facilities including a listening room; antenna measurement laboratory; augmented human interaction laboratory; and interdisciplinary informatics hub.

Degree programmes

- You will be supported in producing an extended individual research project that is of a suitable quality to be published in a peer-reviewed journal.

- This programme is a pathway to a PhD, providing the necessary training to prepare for a career in research and development.

Programme outline
- You will join one of our research groups, taking four selected taught modules and completing an extended research project.

- You can choose four taught modules from any of the modules offered in the School, in line with what is most appropriate for the chosen research project.

Teaching and assessment
- Teaching for all modules includes a combination of lectures, seminars and a virtual learning environment. Each module provides 36 hours of contact time, supported by lab work and directed further study.

- Modules are assessed through a combination of coursework and written examinations. You will also be assessed through an individual project.

Entry requirements
- An upper-second class (2:1) honours degree or equivalent in a related discipline.

- In your application you should identify the research group relevant to your proposed study. Offers are subject to the agreement of a suitable research proposal.

- For international students whose first language is not English, we require English language qualifications IELTS 6.5 or TOEFL (CBT) 237/TOEFL (written test) 575. For more information see the 'International students' section on page 151.

Further information
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MSc by Research in Media and Arts Technology

One year full-time

This new programme aims to produce graduates 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 and communicating results.

Overview
This innovative programme, unique in the UK, comprises four main components:

- a series of advanced taught modules completed during the first six months that include programming interactive digital media, production skills for audio and video, making creative installations and research methods; and

- additional advanced option modules which cover topics ranging from advanced technical skills through human interaction to performance and live art

- specialist project work and a placement project with an external partner leading to a thesis (see www.mat.qmul.ac.uk for a full list of our partners). You may also undertake your placement project with a research partner in a different department or, where appropriate, collaborating departments in other universities.

Why study with us?
- One of the UK's leading research-led universities, we are involved in Tech City, the largest concentration of technology, digital and creative companies in Europe (www.techcityuk.com).

- You will develop a critical appreciation of the technical and creative contemporary applications of digital media. You will also

learn key technical skills that will enable you to produce new applications of your own.

- You will have access to our new state-of-the-art media and arts technology studios, which include the listening room, control room and performance laboratory, as well as other research and performance facilities including the augmented human interaction laboratory and the Pinter Studio Theatre.

Programme outline
Core modules
• Advanced Research Methods • Interactive Digital Multimedia Techniques (including processing/Max MSP/Jitter/Arduino) • Sound Recording and Production • Digital Arts Documentary (film production and critical review of a new media Art piece) • Group Project and Advanced Placement Project

Plus one option module from
• Fundamentals of Digital Signal Processing • Digital Broadcasting • Java Programming • Design for Human Interaction • Multimedia Systems • Computer Vision and Neural Networks • C++ for Image Processing • Foundations of Information Retrieval • XML and Structured Information • Distributed Systems and Security • Performance Research

Teaching and assessment
- The core modules are assessed through coursework alone.

- Option modules are examined through a combination of coursework and written examinations.

- The advanced placement project is examined by thesis and viva.

Entry requirements
- An upper-second class (2:1) honours degree or equivalent in a related science, engineering or design-oriented discipline and evidence of programming or mathematical ability.

- 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 this programme.

Further information
Richard Kelly
MAT Programme Manager
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email: mat-enquiries@eecs.qmul.ac.uk

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 220 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 research 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, visit: www.eecs.qmul.ac.uk/phd

Further information
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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 specialist option 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, who include the 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 new state-of-the-art media and arts technology

studios, which include the listening room, control room and performance laboratory, as well as other research and performance facilities including the augmented human interaction laboratory and the Pinter Studio Theatre.

For more detailed information and funding opportunities, see: www.mat.qmul.ac.uk

Further information
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MAT Programme Manager
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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 £6m, which includes a prestigious EPSRC-platform grant valued at £1m to fund post-doctoral researchers in the field of antennas for healthcare and imaging.

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. We recently received a major EPSRC Programme Grant valued at £4.4m called Quest ("The Quest for Ultimate Electromagnetics using Spatial Transformations") where we are working with colleagues from Oxford (Materials), St Andrews (Physics) and Exeter (Physics) to research and bring to practical applications this exciting new concept of controlling how electromagnetic waves propagate by controlling the materials properties in 3D.

Our research on terahertz spectroscopy aims to help scientists visualise 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 MIEEE MIET (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 CPhys MInstP MIET (W'gong, Australia) Lecturer
Metrology of quasi-optical systems, dielectrometry, THz spectrometry for biochemical sciences

Professor Yang Hao FIET SMIEEE 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-wideband antennas

Khalid Rajab BSc MA PhD (Penn State)
Lecturer
Antennas, active metamaterials, transformation electromagnetics structures, computational electromagnetics, Terahertz systems

Rostyslav Dubrovka
CAD/CAM Engineer
Lagrangian dynamics analysis of THz/far i.r. spectra of amino acids

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

Staff profile: Dr Akram Alomainy

Lecturer, Electronic Engineering

"My interest in antennas and electromagnetics started from the first year of my degree programme (MEng Communication Engineering) when I took the module Electric and Magnetic Fields. From that point on I wanted to find out more about antennas and how they can 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 Queen Mary 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

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 (BKeeper) 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 research interests

Nick Bryan-Kinns BSc MSc PhD(Lond)
Senior Lecturer
Mutual engagement and group creativity, especially interactional sound and music, ranging 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

Panos Kudumakis BSc, MSc, PhD (Lond), SMIEEE
Research Manager / qMedia
Standardisation related to music technologies and interoperable multimedia architectures and services

Andrew McPherson BSc Music BSc MEng(MIT, USA) PhD(U.Penn, USA)
Lecturer in Digital Media
Augmented instruments, new performance interfaces, study of expressive performance, hardware systems for music signal processing

Marcus Pearce MA(Oxon) MSc(Edin) PhD(City)
Lecturer in Sound and Music Processing
Music perception and cognition, auditory perception, auditory neuroscience, music and emotion, empirical aesthetics, neuroaesthetics, expectation, predictive coding, computational psychology

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 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(Essex) SMIEEE FAES FIEE FBCS CEng
Professor of Signal Processing
Digital audio and music, music information retrieval, semantic and intelligent audio, semantic media, linked data and metadata

Professor Geraint A. Wiggins MA (Cantab) PhD (Edin) PhD (Edin) MIET MBCS
Professor of Computational Creativity
Computational creativity, music cognition, cognitive modelling, statistical learning, logic programming and automated reasoning

Dr Tony Stockman BTech PhD(Bradford)
Senior Lecturer
Human Computer Interaction, Auditory
Displays, Data Sonification

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 novel
theoretical developments and new applications
in areas including separation logic, logic for
continuous systems, information theory for
security, and process types for web services.
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

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

Staff profile:
Professor Peter McOwan

Professor of Computer Science

"I work on biological and computer vision face perception, synthesis and mathematical modelling of perception, expression and gesture recognition for robots and promoting public understanding of computer science.

"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!"

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

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

Nikos Tzevelekos Diploma(Athens) MSc
PhD(Oxford)
Lecturer, RAEng Research Fellow
Logic and semantics of computation, game semantics, program analysis and software verification, automata on infinite alphabets, category theory

Computer Vision

Our Computer Vision group is internationally renowned for its work on computational modelling of the perception of action and activity, visual analysis of behaviour, face recognition, articulated structure and deformable surface reconstruction from video, and biologically inspired perceptual models; and pioneered techniques for robust real-time object detection and tracking, mining behaviour and action in video, multi-view super-resolution, multi-camera object re-identification, and multi-camera scene analysis.

Our core expertise includes statistical machine learning, time series analysis, dynamic Bayesian graph models, multi-view geometry, multi-modal data fusion, and neurobiologically inspired vision. 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; and 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 in CCTV; HUMANIS, 3D models of deformable and articulated objects; APIDIS, autonomous production of images based on distributed and intelligent sensing; and INSIGHT, video analysis and selective zooming using semantic models of human presence and activity. 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)
Reader in Computer Vision
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(Trieste, Italy) 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 FBCS
Professor of Visual Computation
Computer vision, machine learning, visual analysis of behaviour, biometrics, visually mediated interaction, semantic video analysis

Miles Hansard BSc MRes PhD(UCL, London)
Lecturer
Binocular vision, multi-view reconstruction and depth-cameras, geometric and statistical models of human perception

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

Yi-Zhe Song BSc(Bath) MSc(Cantab) PhD(Bath)
Lecturer
Computer vision, computer graphics, segmentation and grouping, non-photorealistic rendering, object classification, mobile visualisation

Tao Xiang BSc(Xi'an Jiaotong, China) MSc(CUC, China) PhD(NUS, Singapore)
Senior Lecturer
Computer vision, machine learning, data mining, video analysis, 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.

Research areas

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 2012), and social models to enable smarter mobility (SUNSET). We also host world-leading science outreach activity including cs4fn (www.cs4fn.org), qMedia and 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 Gallery the ICA, SHUNT, Eyebeam in NYC 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

Hamed Haddadi BEng(Hons) MSc PhD
Lecturer in Digital Media
Social networks, advertising, privacy, network economics & operations

Professor Patrick Healey BSc(Hons) Dip App Psych(Nottingham) MSc PhD(Edinburgh)
Professor of Human Interaction
Communication and miscommunication, development of technologies to enrich and transform human interactions

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, and privacy

Matthew Purver BA MPhil(Cantab) PhD(Lond)
Lecturer
Computational linguistics, natural language processing, logical and statistical dialogue modelling for human-computer and human-human interaction, both face-to-face and online

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 standardization 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, REVERIE, Cubrik.

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, nonphotorealistic 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

Hatice Gunes BSc PhD(Sydney)
Lecturer
Affective computing, audio-visual information processing, machine learning, multicue and multimodal emotion recognition, human-computer and human-virtual agent interaction

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, are active in joint teaching and research with Beijing University of Posts and Telecommunications,

Research areas

as well as a joint lab in Macao. The wireless research in the group is growing rapidly and current research now covers areas including cognitive radio, cooperative networks and MIMO, self-organising radio resource management, smart antennas, energy efficiency and capacity improvements, cross layer design, vehicular communication technologies, sensor networks and network security.

The group is active in many key areas of the current and future internet, such as cloud, content delivery, and online social networks. Another specialty of the group is the use of mathematical formalisms and methodologies to model 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, a software-based service business formed to commercialise research on the perceptual quality of networked applications.

Staff research interests

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

Dr Michael Chai BEng(Hons) MSc PhD MIEEE
Joint Programme Lecturer
Wireless networking and protocols on smart grid, vehicular networks, heterogeneous wireless networks, Internet of things, LTE/LTE-A, Cloud radio access network

Dr Yue Chen BS MS PhD MIET MIEEE
Director of Offshore Operations
Next generation wireless networks, intelligent radio resource management, CoMP, cognitive radio, intelligent transport system, smart grid

Félix Cuadrado MEng PhD MIEEE
Lecturer
Autonomic computing, cloud computing, services engineering, big data computing platforms

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

Maged Elkashlan BSc MSc PhD(UBC)
Lecturer
Cooperative wireless networks, MIMO, cognitive radio, physical layer security

Paula Fonseca BSc PhD(London) MIET
Teaching Fellow
Previously worked for major telecoms companies as R&D engineer, modelling IP differentiated services' control and implementing features for network switches

Yue Gao (Fank) PhD IET IEEE
Teaching Fellow
Cognitive radio, especially on cognitive and cooperative sensing; navigation on GPS, Galileo and Compass; smart compact antennas

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(London) MIET
Reader
Internet technologies, next generation
optical networking, energy-aware resource
management, body area networking and
wireless sensor networks

Professor Jonathan Pitts MEng PhD(London)
MIEEEE
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 (London) MIET
CENG
Senior Lecturer
Modelling, probabilistic analysis, simulation
and measurement of broadband packet
networks, including wireless systems

Yan Sun BEng MSc PhD(Lond)
Teaching Fellow
Routing strategy in ad-hoc wireless networks,
energy saving solutions in Internet of Things,
cross-layer modelling design for the next
generation of wireless network

Professor Steve Uhlig MSc PhD (Louv) MIEEE
MACM
Professor of Networks
Internet measurements, traffic engineering,
routing, software-defined networking, content
delivery, network infrastructure virtualization

Vindya Wijeratne BEng PhD(Lond)
Lecturer
Network performance specifically active queue
management and differentiated services,
accelerated simulation, virtual router platforms

Staff profile: Tony Stockman

Senior Lecturer

"I work on the development and evaluation of audio
displays for computer systems and mobile devices.
The users of these systems are either visually impaired
people or people using devices with small screens
such as mobile phones or Personal Digital Assistants
(PDAs). I am currently working on a system to enable
visually impaired people to work with sighted
colleagues to be able to create and analyse diagrams
such as flow charts, organisation charts, maps, etc. I
am also working on are a virtual environment for
training blind football teams, a system to improve the
accessibility of spreadsheets and a system to enable
musicians to mix their own sound while on stage.

"Queen Mary is a vibrant and welcoming workplace in
which people from across the world collaborate and
are encouraged to come up with ideas and to push the
boundaries of technology. As a teacher, it is rewarding
to work in an environment where the facilities provided
enable students to experience state-of-the-art
systems."

Research areas

Risk and Information Management

The Risk and Information Management group undertakes leading-edge interdisciplinary research in decision analysis and risk, databases/information retrieval, personalisation, learning, uncertainty, and Bayesian methods. Our involves numerous commercial partners and a company Agena (www.agenarisk.com) which grew directly out of research by key members of the Group. Agena delivers Bayesian Network solutions.

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' (typically causal Bayesian networks) that use both data and expertise as inputs, to support expert decision making in multiple application domains. We are also currently working on improved decision making in medical, legal, systems engineering, security and safety applications.

Our 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. Our 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

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

Chrisantha Fernando MA(Oxon) BM BCh(Oxon) MSc(Sussex) PhD(Sussex)
Lecturer
Darwinian neurodynamics, cognitive science, theoretical biology, computational neuroscience, evolutionary computation, origin of life, Bayesian cognition, artificial life, machine learning, artificial intelligence

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 user-based 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 biomaterials. The latter includes tissue and cell engineering, orthopaedic implant design, interfical science and bio/nano science.

The School's research is co-ordinated within the following research groupings: • Biomedical Engineering and Materials • Modelling and Simulation in Engineering Systems • Functional Nanomaterials

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 advance 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: 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, and a PIV system.

- Experimental thermofluids engineering facilities: heat transfer and condensation rigs, 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.

- 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,

Research quality indicators

Research Assessment Exercise (RAE)
Following the RAE 2008, the materials department at Queen Mary was judged to be among the top five materials departments in the UK, in terms of research power (quality x volume). The RAE also showed that 90 per cent of our research activity is internationally recognised, and that 55 per cent 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. Notably, the School's research citations were ranked 1st (Mechanical and Aeronautical Engineering) and 2nd (Materials) in the UK in the 2011 QS World University Rankings.

Projects, funding, research grants and awards
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) and the EU as well as from a multitude of industrial sponsors, including Rolls Royce, Airbus UK, EADS UK Limited and Apatech UK.

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 right for contact details.

International Science and Engineering Excellence Awards (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 £4,000 per year to reward outstanding and

exceptional achievement. These awards are for taught postgraduate programmes. 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/MRes admissions enquiries
Postgraduate Admissions Co-ordinator
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 co-ordinated 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 on a single campus with good library facilities at hand.

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 Liaison Forum 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 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.

The Institute of Physics and Engineering in Medicine (IPEM) approved the MSc Medical Electronics and the Physics for accreditation.

Work is in progress to gain accreditation for the remaining programmes. Accreditation contributes to the professional portfolio, which enhances career prospects and can form the major component of an application for Chartered Engineer status.

All postgraduates are 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).

What skills and knowledge will you develop?

Whichever programme you study, you will become competent in analytical thinking, research capability, experimental skills and will also develop industrial awareness.

In addition, the School has links with Student Employment Services Limited (SES) who provide additional support in arranging postgraduate placements and work experience.

Where do our graduates work?

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. Depending on your course, you may find yourself working in a number of different sectors including general engineering, aerospace, energy and energy systems, mechanical engineering, materials, or in healthcare.

Our graduates have gained research, development and consultancy positions within companies such as Airbus, Air Europa, Alcoa, BAE, Bridgestone, Corus, Dow Chemicals, DePuy, DSTL, Airbus, GlaxoSmithKline, Rolls Royce, Caterham F1, NHS, Philips, Ceram, Apatech, Astrium, 3M and many more.

In addition, many graduates have continued their studies to PhD level, either at Queen Mary or at other prestigious universities around the world. Our PhD graduates have achieved success in a wide range of postdoctoral positions both within the world of academia and in industrial research posts.

Student profile: David Emberson MSc Sustainable Energy Systems, studying for a PhD in Engineering

"Before starting my masters I was working as a science teacher in a north London secondary school. I decided that I wanted a change of career and to return to doing science and hopefully to become a researcher.

"I chose Queen Mary because the course was just what I was looking for and I wanted to study in the London area.

"During my masters there was generally excellent teaching. I received good support from a number of people in the department and there was a great deal of help in terms of progression onto a PhD. I really enjoyed the range of people I studied with and our shared interest in what we were studying. The work ethic of my fellow students and the demands made of us were a very good incentive to improve, work hard and achieve as much as possible.

"I had a rather large gap between my undergraduate and postgraduate studies. I found the postgraduate level much more professional and challenging. It was a big shift from working in a school as a teacher, but one which I really enjoyed."

Degree programmes

MSc Aerospace Engineering

One year full-time

Aerospace engineering has come along a way since the early days of powered flight. Employers now require skills ranging 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, and understand complex theoretical and computational models.

Programme description

This programme will give you advanced skills in computational modelling, numerical techniques and an in-depth understanding of engineering approaches to current aerospace problems. You will learn the research and experimental skills necessary to work in the aerospace engineering industry, whether as a researcher or as an engineer for a major aerospace company. You will also collaborate with researchers working on alternative fuels sources, so it is relevant and timely.

Why study with us?

- This MSc programme is available to students from a variety of non-engineering backgrounds such as physics, maths, and electronic engineering.

- The first programme of its type in the country, it offers some unique modules including, Aeroelasticity, Crash Worthiness, and Space Engineering.

- Aerospace engineering is an employment-related field, which allows you to keep up-to-date with the latest developments in design, aerodynamics, propulsion and technology.

- The programme will prepare you to develop new computational and technological products for the aerospace industries.

- You will join research groups working at the cutting edge of aerospace engineering, and computational modelling.

Programme outline
Core modules
Research Methods and Experimental Techniques • Research Project (four modules)

Option modules
Advanced Flight Control
and Simulation of Aerospace Vehicles •
Computational Fluid Dynamics • Advanced
High Speed Aerodynamics • Aeroelasticity •
Vehicular Crashworthiness • Computational
Engineering • Combustion Concepts and
Modelling • Mechanics of Continua• Robotics

Teaching and assessment
• Methods of assessment include coursework
  and formal examinations. Some 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.

• International students, please see the
  'international students' section on page 150.

Further information
Postgraduate Admissions Co-ordinator
Tel: +44 (0)20 7882 8735
email: sems-recruitment@qmul.ac.uk

MSc Biomedical Engineering

One year full-time

*Biomedical engineering is a rapidly developing,
multi-disciplinary field of engineering that
applies the principles of science and
engineering to biological and clinical problems.
On this programme you will develop an in-
depth understanding of engineering
approaches to biological problems, including
the advanced experimental, numerical, and
computational modelling techniques sought
by industry.*

Student profile: 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

Overview

Biomedical engineers rely on both traditional engineering methodologies and cutting-edge techniques, which have been adapted for use with complex biological systems. On the course you will learn about the design, development, implementation and operation of medical devices and systems used in prevention, diagnosis and treatment of disease. You will also look at tissue behaviour in health and disease and will explore the development of software products and theoretical models that can enhance the understanding of these issues. Real-life case studies, drawn from a range of clinical disciplines including orthopaedics, cardiovascular medicine, urology, radiology and rehabilitation, are examined throughout the programme.

Why study with us?

- This programme is taught by medical engineers who have an internationally leading reputation in research, and work closely with industrial partners in Europe, the US and Asia.

- World-renowned specialists from the Barts and The London School of Medicine and Dentistry provide vital contributions to the programme.

- You will work on a biomedical engineering-related project supervised by a member of academic staff and will integrate with a wider research team.

- You will have access to our excellent laboratory facilities, which include: a human performance laboratory with motion analysis systems, breath-by-breath analysis system, a treadmill instrumented with force plates, EMG systems and numerous other assessment tools and devices; a cell and tissue engineering suite, housing cell culture labs, a molecular biology unit with quantitative rtPCR capability, and a radio-isotope labelling facility; a general purpose laboratory, which incorporates advanced mechanical test machines and standard biochemical/cell biology analysis equipment; and a microscopy unit.

Programme outline

Core modules

Research Methods and Experimental Techniques • Medical Ethics, Law and Regulatory Practice in Bioengineering • Research Project (four modules)

Option modules

Biomechanics • Computational Fluid Dynamics • Advanced Biofluid Mechanics • Tissue Engineering and Regenerative Medicine • Principles and Applications of Medical Imaging • Biomedical Engineering of Urology • Implant Design and Technology • Clinical Measurements • Surgical Techniques • Mechanics of Continua

Teaching and assessment

- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements

- Undergraduate degree (minimum second class honours or equivalent) in engineering, medicine, or the physical sciences (evaluated upon application).

- International students, please see the 'international students' section on page 150.

Further information

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

MSc Computational Aided Engineering

One year full-time

Computational aided engineering (CAE) is one of the fastest growing fields within engineering and underpins design and analysis in all engineering disciplines. This programme enables you to develop advanced computational skills, while focusing on a specific sector of engineering, including aeronautical, mechanical, biomedical or sustainable energy engineering.

Overview

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. This programme will provide you with a solid background in computational and numerical methods, as well as relevant aspects of programming languages such as C++. You will be introduced to a wide range of aspects of computation in engineering, both in structures and fluids, including numerical optimisation. You will also take advanced modules in your chosen specialised area of engineering. The numerical analysis skills you have gained are then applied to engineering problems in your research project.

Why study with us?

- This is a unique course geared toward students with an interest in computers as well as specific fields of engineering.

- Research projects 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.

- The skills and knowledge you will develop on this programme will enhance your prospects for employment in leading industrial companies and research institutions.

Programme outline

Core modules

Mechanics of Continua • Computational Engineering • Computational Fluid Dynamics • Numerical Optimisation in Engineering Design • Research Methods • Modern Computation in Physical Science

Option modules – two from

Advanced Flight Control and Simulation of Aerospace Vehicles • Vehicular Crashworthiness • Advanced Gas Turbines • Advanced Combustion in Reciprocating Engines • Advanced High Speed Aerodynamics • Implant Design and Technology

Teaching and assessment

- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements

- Undergraduate degree (minimum second class honours or equivalent) in engineering physics or mathematics. Computer science graduates 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 150.

Further information

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

Degree programmes

MSc Sustainable Energy Systems

One year full-time

As the costs of sourcing and delivering fossil fuels soar, there is an increasing demand for sustainable, alternative forms of energy and for engineers specialising in this area. This interdisciplinary degree addresses the scientific, engineering and technical aspects of developing sustainable energy systems.

Overview
This programme addresses global concerns about the availability of energy sources, and the sustainable exploitation of these sources using new technologies. Large projected increases in global population and energy demand, combined with concerns related to security, and the effects of energy production and use on the environment, mean that sustainable energy is perhaps the single greatest challenge facing the world in the Twenty-First Century. As a result there is an increasing demand for engineers specialising in this field. This programme will provide you with unique expertise in the fundamentals of energy and the environment. You will learn to develop new technologies to extract energy from diverse energy sources and to use existing energy conversion devices. This technology includes engineering and materials disciplines for the analysis, design and construction of wind turbines, fuel cells, solar systems, and other sustainable energy systems, as well as more traditional energy conversion systems (such as alternative fuels in contemporary power plants).

Why study with us?
- This degree is extremely relevant to current world issues, and is particularly suitable if you are interested in finding solutions to the energy crisis through technological research.
- 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.

- This programme combines modules in policy, materials and engineering that relate directly to the current energy sector. It will qualify you to pursue roles in research, development and consultancy, in diverse fields such as renewables, sustainable, chemical engineering, chemical processing industry, solar cell engineering, materials and chemistry; traditional energy projects; and the automotive and aircraft industry.
- You will benefit from our close links with industry. Recently, the chief engineer from the Olympic village project was a guest speaker at the School. There is also general input from organisations including Shell, the UK power industry, and the renewable energy sector.
- You will have access to extensive wind tunnel facilities, experimental thermofluids engineering facilities and excellent computing resources such as high-performance PC and SGI clusters, and Linux and UNIX work stations.

Programme outline
Depending on your academic background, the programme will include two to four core modules, four to six module options and a research project.

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

Option modules
Renewable Energy Sources • Renewable Energy Materials • Energy Economics and Management of Sustainable Energy • Advanced Fluid Mechanics and Heat Transfer • Combustion Concepts and Modelling • Advanced Gas Turbines • Aeroelasticity • Advanced CFD • Advanced Aerodynamics • Computational Engineering • Advanced Combustion in Reciprocating Engines

Teaching and assessment

- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements

- Undergraduate degree (minimum second class honours or equivalent) in engineering, physical sciences, mathematics or equivalent.

- International students, please see the 'international students' section on page 150.

Further information

Postgraduate Admissions Co-ordinator
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

On this programme you will learn to apply the principles of the physical and engineering sciences to the practical problems of biomedicine and clinical practice. By the time you graduate, you will be able to make valuable contributions to the advancement of medical science and technology.

Programme description

This programme will broaden your knowledge of both electronic engineering and physics, and how these disciplines can be applied to medicine. You will focus on medical electronics, medical physics, physiology, physiological measurement techniques, and the design of instruments and the safety of electronic devices. You will acquire the medical vocabulary you need to communicate effectively with clinical colleagues. You will also work on a research project, such as the design

and development of a medical instrument, acquiring key skills in research and project management.

Why study with us?

- This programme is fully accredited by the Institute of Physics and Engineering in Medicine.

- This programme was established in 1968 and has been tremendously successful in producing graduates equipped for careers in the healthcare profession.

- We have a close association with a number of medical electronics and physics departments in local NHS Trusts, including Barts and The London School of Medicine and Dentistry.

- You will be joining a School with well-established research groups in medical engineering and biomaterials.

- No previous biomedical knowledge is required.

Programme outline

Core modules

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

Option modules

Clinical Measurements • Chemical and Biological Sensors

Teaching and assessment

- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Degree programmes

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 150.

Further information
Postgraduate Admissions Co-ordinator
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

Providing a rigorous training in both theoretical and applied research, this interdisciplinary programme is designed to enable you to pursue a career as a materials scientist, enhancing your current engineering knowledge with a particular focus on materials research.

Overview
The development of innovative approaches to the design, development and manufacture of new materials is a highly effective way for manufacturers to achieve a competitive advantage. Recent technological and methodological advances have contributed to the transformation of materials and their functions. This programme will provide an insight into areas of manufacturing, planning and control systems, knowledge-based systems and measurement and manufacturing systems. A substantial component of the programme is the research project, which will be based within one of the School's materials-based research groups, and focused in the fields of ceramics, polymers, composites, elastomers, functional materials or manufacturing technologies.

Why study with us?
- We were the first materials department in the UK and have continued to operate at the forefront of international materials research.
- A new NanoVision Centre enhances the experimental nanomechanics and high resolution imaging capabilities of the School.
- Other materials-specific facilities include a state of the art Spectroscopy Lab, and a Thermal Material Analysis Lab.
- You will build on your engineering background to gain an advanced, yet broad knowledge in materials science, with the freedom to specialise through a research project.

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

Option modules
Manufacturing Processes • Advanced Ceramics • Advanced Topics in Biomaterials • Thermodynamics and Kinetics of Phase Transformations • Composites • Environmental Properties of Materials • Nanotechnology and Advanced Functional Materials

Teaching and assessment
- Assessment methods include coursework and formal examinations. Some 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 voce 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 150.

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

MRes Materials Research

One year full-time

This programme offers you the freedom to undertake an in-depth piece of materials research combined with the benefits of close supervision from experts in the field. It serves both as a qualification for entry into a research career in industry or as an enhanced route to PhD research.

Overview
This programme provides graduates with the foundations for a research career in industry, the service sector, the public sector or academia, and is designed following guidelines provided by the Engineering and Physical Sciences Research Council (EPSRC). The taught modules within this programme are designed to provide a high-quality training in the methods and practice of research, as well as providing complementary transferable skills through option modules, which focus on business and management-related topics. A substantial component of the programme is the research project, which will be based within one of the School's materials-based research groups, and focused in the fields of ceramics, polymers, composites, elastomers, functional materials or manufacturing technologies.

Why study with us?
• We were the first materials department in the UK and have continued to operate at the forefront of international materials research.

• A new NanoVision Centre enhances the experimental nanomechanics and high resolution imaging capabilities of the School.

• Other materials-specific facilities include a state of the art Spectroscopy Lab, and a Thermal Material Analysis Lab.

• You will build on your engineering background to gain an advanced, yet broad knowledge in materials science, with the freedom to specialise through a research project.

Programme outline
Core modules
Research Methods • Materials Selection and Design • Research Project

Option modules
Manufacturing Processes • Advanced Ceramics • Advanced Topics in Biomaterials • Thermodynamics and Kinetics of Phase Transformations • Composites • Environmental Properties of Materials • Nanotechnology and Advanced Functional Materialist

Teaching and assessment
• Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements
• Undergraduate degree (minimum second class honours or equivalent) in materials science.

• International students, please see the 'international students' section on page 150.

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

Degree programmes

MSc Biomaterials

One year full-time

Biomaterials are modified natural or synthetic materials which find application in a spectrum of medical implants for the repair, augmentation and replacement of body tissues. As people live longer and expect to retain their mobility, the demand for biomaterials and devices is increasing.

Overview

Biomaterials save lives, relieve suffering and improve the quality of life for a large number of patients each year. As a field, biomaterials combines engineering expertise with medical needs for the enhancement of healthcare. This programme will provide you with an advanced understanding 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 programme. You will also undertake a significant research project linked to the research interests of our academic staff.

Why study with us?

• In the early 1980s, Queen Mary was one of the first universities in the UK to teach biomaterials – we have led the way in biomaterials teaching and research since.

• Designed for those with expertise in conventional materials, engineering or medically related disciplines, this programme will facilitate your development in the biomaterials field.

• You will have access to our excellent laboratory facilities, which include: a cell and tissue engineering suite, housing cell culture labs, a molecular biology unit with quantitative rtPCR capability, and a radio-isotope labelling facility; a general purpose laboratory, which incorporates advanced mechanical test machines and standard biochemical/cell biology analysis equipment; and a microscopy unit.

• You will build on your engineering background to gain an advanced, yet broad knowledge in materials science, with the freedom to specialise through a research project.

Programme outline
Core modules
Materials Research Techniques • Advanced Tissue Engineering and Regenerative Medicine • Nanotechnology and Nanomedicine • Materials Selection and Design • Advanced Structure-Property Relationships in Materials • Advanced Materials Characterisation Techniques • Chemical and Biological Sensors • Science of Biocompatibility • Research Project

Teaching and assessment

• Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements

• Undergraduate degree (minimum second class honours or equivalent) in materials science.

• International students, please see the 'international students' section on page 150.

Further information
Postgraduate Admissions Co-ordinator
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

Materials are at the forefront of both preventative and treatment research in medicine and dentistry. This programme is designed to develop a broad knowledge of the principles underlying the mechanical, physical and chemical properties of dental materials, with particular emphasis placed on materials-structure correlations in both clinical and non-clinical contexts.

Overview

In dentistry, recent developments in materials research have enabled a move away from the use of destructive techniques and intervention towards less damaging, more preventative techniques. This programme covers the key tools and principles relating to the use of dental materials and their underlying functional properties, bioactivity and biocompatibility. You will be introduced to the major classes of materials used in dentistry including polymers, metals, ceramics and composites, as well as specific dental materials applications, such as drug delivery and tissue engineering. By the end of the course you will have a good knowledge of issues related to dental materials, and will be able to justify material selection criteria and manipulation instructions.

Why study with us?

- The programme is designed for dental surgeons, materials scientists and engineers who wish to work in the dental support industries and the materials health sector generally.
- The latest innovations in medical practice, drug development and diagnostic tools are often tested in the field of dentistry, making this an exciting area to work in.

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 a place at QUeen Mary.

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.

Degree programmes

- This programme features joint teaching within the School of Engineering and Materials Science and the Institute of Dentistry, equipping you with an overview of the field of dental materials and the knowledge necessary to participate in research or product development.

- You will be taught by experts who are working on the latest developments in this area.

- The programme enables practitioners the opportunity to update their knowledge in the latest developments in dentistry.

Programme outline
Core modules
Oral Biology: Surfaces and Interfaces in Dental Materials • Medical Ethics • Science of Biocompatibility • Research Methods • Dental Materials • Introduction to Oral Biology

Option modules
Biomineralisation and Biomimetics • Minimally Invasive Dentistry

Teaching and assessment
- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements
- Undergraduate degree (minimum upper second class honours or equivalent) in materials science, dentistry or dental technology.

- International students, please see the 'international students' section on page 150.

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

MSc Polymer Science and Technology

**One year full-time
(Subject to approval)**

If you have a materials or engineering background and want to develop your knowledge of the polymer materials sector, this programme is for you.

Overview
The programme will provide a strong grounding in the science of materials, combined with an in-depth understanding of polymers, the technology related to their study, and the latest breakthroughs in polymer research. The programme will take advantage of the resources available at Queen Mary through the Nanoforce lab, as well as the expertise of our highly regarded research staff in the fields of ceramics and rubbers.

This degree develops your understanding of polymers through expert tuition and experimental and research experience that uses the advanced technologies and equipment that is available on campus. Upon graduation you will be able to develop new materials or design high technology products for a wide range of industries. Polymer components are used in sectors, including the aerospace, medical and sports fields to develop advanced lightweight materials for a range of applications. You may also be prepared to continue with research at PhD level upon successful completion of this course.

Why study with us?
- We were the first materials department in the UK and have continued to operate at the forefront of international materials research.

- You will build on your engineering background to gain an advanced knowledge in materials science, with a focus on polymer science and technology. This will enhance your career prospects if you decide to

continue working in industry or qualify you to move onto a PhD.

- The course will take full advantage of the College's state-of-the-art polymer, composite and elastomer research laboratories and the well-equipped materials characterisation, materials testing and nano-visualisation facilities.

Programme outline
Core modules
Research Methods and Experimental Techniques • Polymer Physics • Environmental Properties of Polymeric Materials • Nanocomposites • Composites, Materials Selection and Design • Advanced Materials Characterisation Techniques • Manufacturing Processes • Research Project

Teaching and assessment
- Assessment methods include coursework and formal examinations. Some 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 voce examination.

Entry requirements
- Undergraduate degree (minimum upper second class honours or equivalent) in materials science, dentistry, dental technology or a related field.

- International students, please see the 'international students' section on page 150.

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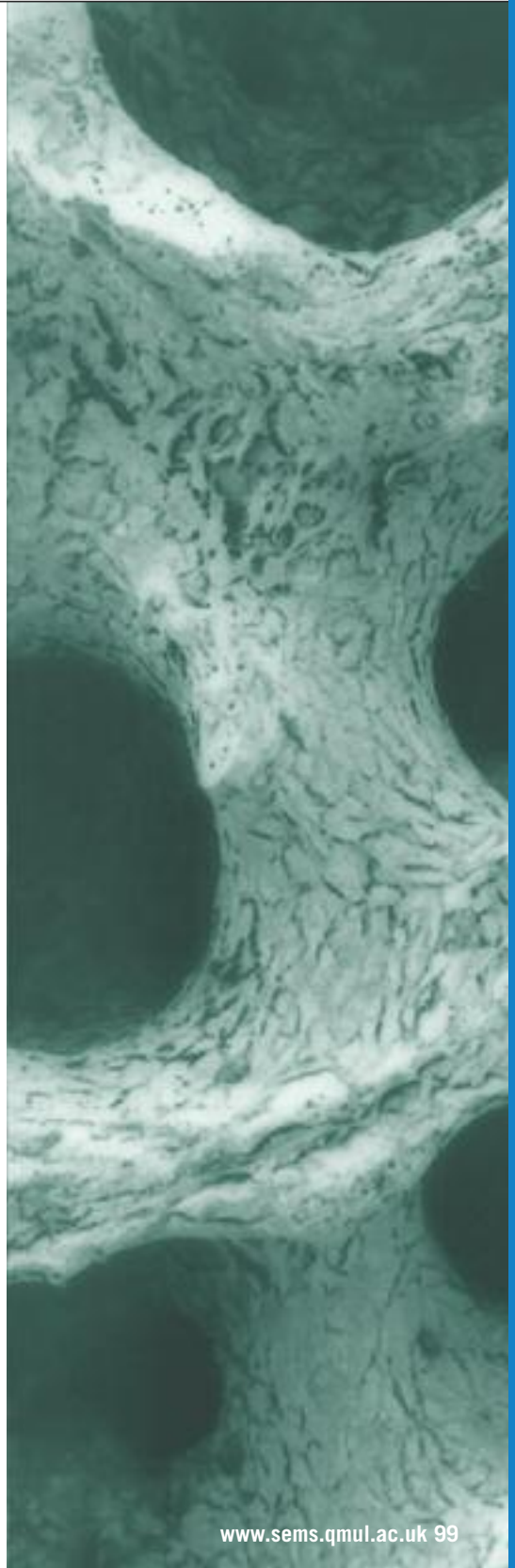
Research

We welcome postgraduate students and visiting research fellows to undertake research in our areas of interest (see right). 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 150.

Biomedical Engineering and Materials

The complementary disciplines of engineering and materials science can provide understanding of complex, hierarchical systems in biology. 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, multi-scale approach is taken with respect to both structural organisation and reactivity of tissues studied from nano- to 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 within the College through the use of central UK facilities. We are also involved in advancing new diagnostic tools and techniques, which include spectroscopic analysis of cancer tissue in vitro, in vivo sensors and 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 bioactive nanocomposite coatings for enhanced hip prostheses, novel bioceramics for hard tissue repair and bone tissue engineering. Such new generation materials can be developed by companies linked to Queen Mary such as Progentix Orthobiology and Apatech, the latter having recently been acquired by Baxter International.

Modelling and Simulation in Engineering Systems

We conduct world-leading research within numerical modelling and simulation on the development and multi-disciplinary applications of innovative simulation tools using finite element methods (FEM), discrete finite element methods (DFM), meshless methods, boundary element methods (BEM) and adjoint optimization methods, and automatic control methods. Sample applications are in fluid dynamics of traditional engineering, bioengineering, mechanical and aeronautical structures, material properties, multi-phase flows, fluid-structure interactions, optimal shape design. Experimental modelling and simulation activity concentrates in aerodynamics, energy-conversion systems, fuels and novel power plants, heat transfer, in modelling the human cardiovascular system, and in various renewable-energy materials-characterization techniques.

Our low turbulence and specialty wind tunnels are used in aerodynamics, fluid flow, flow control, turbulence modelling, and fluid-structure interactions using hot-wire, lasers and specialty techniques. Our anechoic chamber is used for noise studies in jet and other engine flows.

Sustainable-fuels and energy-conversion systems research for gas turbines, reciprocating-piston engines, and various novel engine arrangements is conducted in our unique high-pressure combustor facility and optical-access reciprocating-piston engines. In these facilities we model the effects of fuel composition, flame propagation, energy-conversion system-design aspects, and other factors using emissions-measuring equipment, analytic techniques, high-speed video recording, and laser measurements. In addition to various specialty experimental setups modelling novel power and propulsion and energy conversion systems, we also conduct two-phase flow heat transfer research of international reputation in three different experimental laboratories, coupled with

Research areas

numerical simulations, aiming at improving the performance of HVAC systems. Recently we have also developed a world-leading experimental capability for in-vitro modelling of the whole human cardiovascular system, in various healthy and diseased conditions, with and without the use of mechanical circulatory support turbomachinery-based devices. This work is aimed at in-vitro modelling advanced biological aspects of the human cardiovascular system, in developing mechanical circulatory support devices and other cardiac prosthetic devices.

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 multifunctional polymeric materials based on carbon nanofillers such as carbon nanotubes, grapheme 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 utilizing 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
(aka 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 aeroacoustics, 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

Federico Carpi 1st Laurea, 2nd Laurea Deg, PhD(Pisa)
Reader in Biomedical Engineering
Artificial muscles and Smart materials, Man-machine interfaces, Bioinspired and Biomimetic systems, Non-invasive diagnostic systems

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

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

Russell Binions, MSci, PhD
Lecturer in Functional Materials
Chemical vapour deposition, chemical sensors, functional metal oxide films

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

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

Julien Gautrot MSc PhD MRSC
Lecturer in Biomaterials
Biomaterials synthesis and characterisation, micro- and nano-patterning, bio-interfaces, stem cell biology

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

Sergey Karabasov BSc MSc PhD DSc(Moscow)
Senior Lecturer in Modelling and Simulation in Engineering Systems
High-resolution numerical methods for computational fluid dynamics, Jet noise, Hybrid hydrodynamics-molecular dynamics

Martin Knight BEng MSc PhD(Lond)
Reader in Mechanobiology and Director of Admissions
Mechanobiology, primary cilia, cell and tissue biomechanics, cytoskeleton, cartilage, osteoarthritis

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

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 modeling

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

Mario Oris Laurea Deg(Milan), PhD(Soton)
Lecturer in Biomedical Engineering and
Biomaterials
Molecular simulation, multiscale modelling,
lipid membranes, high-performance computing

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

Yi Sui BSc(China), PhD(Singapore)
Lecturer in Modelling and Simulation
in Engineering Systems
Numerical simulation of two-phase flows,
Simulation of Incompressible Multi-Phase
Flows, Simulation of blood-erythrocyte
interactions

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

Magdalena Titirici Dipl CHem, MSc(Bucharest),
PhD(Dortmund)
Reader in Materials Science
Biomass Conversion into Hydrothermal
Carbon, Nanostructured Functional Materials,
Stimuli Responsive Polymers

Professor Pankaj Vadgama MBBS 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

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."

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 and tissue mechanics

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

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

Student profile: Luz Romero, MSc Sustainable Energy Systems, studying for a PhD in Materials Science

"Before coming to Queen Mary, I was working in Spain as a consultant and auditor in environmental management systems. I decided to undertake postgraduate study because I wanted to take on a new challenge and to take my career in a new direction.

"I chose Queen Mary because of the quality of the academic system and also because I wanted to come to the UK to improve my English. The College gave me lots of guidance about the life on campus, available accommodation and the programme.

"I found the course content on the Renewable Energies MSc at Queen Mary very appealing. On the course, I was happy with the teaching. I received training in research methods and how to use different search tools, which was very useful in helping me to deliver good results. There was a very friendly environment on my MSc and what I most enjoyed was interacting in a multicultural environment. I also enjoyed the challenge of learning something completely new in a different country.

"Once I finished my MSc, an opportunity to join Dr Russell Binions' team came up and I did not hesitate in applying for a PhD at Queen Mary. As a PhD student I am getting great support from my supervisor."

Mathematical Sciences
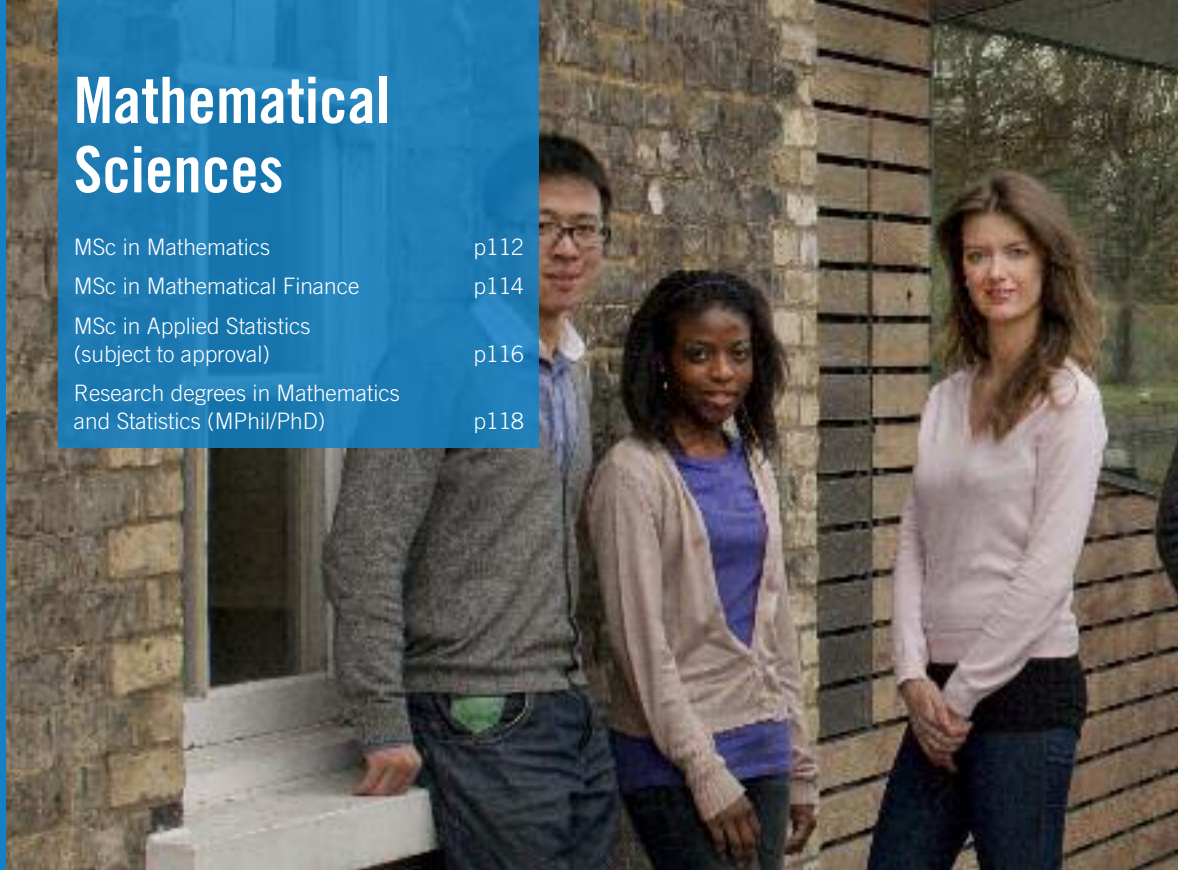
Queen Mary has a distinguished history in the field of mathematics, which was one of the first subjects on offer when the People's Palace opened in 1887. We have been conducting pioneering mathematical research since the 1950s, and as one of the largest mathematical departments in the UK, with over 50 members of staff, we can offer diverse postgraduate study opportunities across the field, from pure and applied mathematics, to finance and statistics. Our staff includes international leaders in many areas of mathematical research, and the School is a hive of activity, providing a vibrant intellectual space for postgraduate study.

Research strengths

The School of Mathematical Sciences has over 40 students currently studying for PhDs, in areas including: combinatorics, group theory, computational group theory, non-commutative geometry, applications of graph theory, representation theory, analysis, complex iteration, dynamical systems, critical infrastructure of networks, equilibrium and non-equilibrium statistical mechanics, theory of large derivatives, design of experiments, Bayesian statistics and biostatistics, combinatorial and statistical design theory and relativity.

We host many academic visitors throughout the year, for both short and longer periods, and also numerous postdoctoral research staff, many of them funded by Research Councils or similar bodies. This all contributes to our rich

academic atmosphere. Our staff also travel widely to attend conferences and conduct research with international collaborators, which ensures that we remain at the forefront of research activity in our fields of interest. We also provide generous support to our research students so that they can attend national and international conferences.

Postgraduate resources

In addition to lively discussions over coffee in the School common room, we offer formal and informal seminars, colloquia and small study groups in the various areas of the School's research activity, often in collaboration with other colleges of the University of London. Postgraduate students and staff participate in all these activities.

We have excellent computing facilities, and all full-time research students have their own workstations. MSc students share a large, recently refurbished office with a dedicated computer network. The College Library takes

many mathematical and statistical 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 and the Royal Statistical Society Library.

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 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 and statistics 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

Research quality indicators

The Research Assessment Exercise
In the most recent Research Assessment Exercise (RAE 2008), the School made a return in four areas: Pure Mathematics, Applied Mathematics, Statistics and Operational Research, and Physics. The RAE 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 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.

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 a studentship you should contact the Postgraduate Admissions Tutor for mathematics or statistics through the Administrative Officer for Postgraduate Studies and Research.

Further information

Administrative Officer (Postgraduate Studies and Research)
School of Mathematical Sciences
Tel: +44 (0)20 7882 5454
email: maths-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

An obvious reason for undertaking an MSc in the School of Mathematical Sciences is if you have a career in academia or the financial sector 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, at home and abroad.

As an MSc or PhD graduate in mathematics and statistics you will have a wide range of career opportunities in finance, industry, and the public sector. The analytic and computing skills that you will acquire are particularly valued in the financial sector and a number of recent PhD graduates have gone on to work in investment banking. Among career choices of recent MSc graduates are financial modelling, work in the civil service and teaching. Others have pursued careers in marketing, management consultancy and commerce. Among our part-time MSc students, we have a number of school teachers who are continuing to work alongside their studies.

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.

Specific examples of graduate destinations include: Civil servant, Office of National Statistics • IT software engineer, Nokia • Data analyst, Greater London Authority • Database analyst, Legal and General • Lecturer, University College Cork • 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

This programme will allow you to develop analytical and computing skills and specialist knowledge in your chosen areas of mathematics and statistics.

Overview

This MSc provides 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. The programme will give you specialist knowledge in your chosen areas of mathematics and statistics, and is an excellent preparation for those who are considering undertaking further research. Reflecting the School's strengths, the main areas that you can explore on this MSc are pure mathematics (especially algebra and combinatorics), applied mathematics (especially dynamical systems, complex systems, computing and astronomy) and probability and statistics.

Why study with us

- You will be taught by helpful, enthusiastic academic staff who are world-experts in their fields.

- The programme is flexible and it allows you to choose modules in different areas or to specialise in one area.

- Our unique fast-track statistics option prepares students who have only first-year undergraduate knowledge in probability and statistics to take our advanced statistics modules. These advanced modules are vital if you wish to pursue a career in statistics.

- We offer a large, recently refurbished shared office space and dedicated computer network for MSc students, fostering a friendly and co-operative learning environment.

Programme outline
You will take eight taught modules, the majority chosen from the modules offered by the School of Mathematical Sciences (see below). You may also be able to choose some approved modules in astronomy and up to two mathematics modules offered at other colleges of the University of London. You will also be required to complete a dissertation project.

Modules
The precise selection of modules offered by the School varies from year to year. These modules were offered in 2011-12:

- Extremal Combinatorics/Advanced Combinatorics
- Group Theory/Further Topics in Algebra
- Topology/Measure Theory and Probability
- Dynamical Systems/Complex Systems
- Scientific Computing
- Cosmology/The Galaxy
- Applied Statistics/Bayesian Statistics
- Computational Statistics/Mathematical Statistics
- Topics in Probability and Stochastic Processes

Teaching and assessment
- You will be assessed through a combination of coursework and examinations (depending on the module), and on the dissertation project.
- Written examinations take place in May and June and the dissertation project is assessed independently by at least two examiners in September.

Entry requirements
- A good upper-second class honours degree or equivalent in mathematics, or in mathematics with another subject, such as statistics, philosophy, physics or computing. The undergraduate modules you have taken must provide sufficient background to enable you to take an appropriate selection of our MSc modules.

Student profile: Georgina Eaton, MSc in Mathematics

"I chose to do an MSc because I really enjoyed my undergraduate degree and was interested to explore advanced topics in mathematics. Also, the current economic climate has increased the need for those wishing to pursue careers in specialist areas to be better qualified in their subject.

"I found the quality of the teaching in my undergraduate degree at Queen Mary to be excellent, so continuing my studies here was an obvious choice for me. Also, Queen Mary offered a bursary which contributed towards the tuition fees.

"The lecturers on my MSc are very encouraging and supportive. During lectures you can ask questions about the material being presented and the lecturers are always happy to see you individually about any problems you may have with the work.

"I am a student ambassador for the mathematics department at Queen Mary. This involves representing the department at open days, taking students on campus tours, and presenting talks about life as a student.

"Outside of maths, I am a member of the College Cheerleading team. This has been a great way to keep fit and, at the same time, meet and socialise with people in different years studying other courses. The team also raises money for charity. Last year I walked 17 miles with the team to raise money for Cancer Research UK. Off campus I teach dancing, in particular, Ballet, Modern, Tap, Acrobatics and Lyrical dance at a dancing school."

Degree programmes

- Where English is not your first language, IELTS 6.5 (or equivalent). For more information on international entry requirements, see page 151 or visit www.qmul.ac.uk/international

Further information
Administrative Officer (Postgraduate Studies and Research)
School of Mathematical Sciences
Tel: +44 (0)20 7882 5454
email: maths-pg@qmul.ac.uk

MSc in Mathematical Finance

One year full-time, two years part-time

This intensive programme will allow you to develop strong analytical and quantitative skills in finance and 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.

Overview
The MSc in Mathematical Finance is a specialist one-year postgraduate taught masters programme aimed at providing graduate students and professionals with a rigorous training and strong analytical and quantitative skills in finance. Our programme is taught jointly by the highly respected Schools of Mathematical Sciences and Economics and Finance at Queen Mary.

This programme prepares you for a wide range of careers, especially in the banking and finance sector, as well as in consultancy, industry and commerce. Previous students have gone on to achieve success in the financial sector, industry, government service, academia, and international organisations.

Why study with us?
- You will be taught by distinguished academics and experienced practitioners who will apply the theory to real-world scenarios.

- Our programme is particularly designed to enhance your practical skills in mathematical finance. We also offer unique professional skills workshops and a seminar series with speakers from industry.

- You will study in recently refurbished MSc student offices with dedicated computer network and software, hot desk areas, study lounge and mathematical finance resources room.

- Queen Mary is conveniently located in central London, close to the financial districts of City of London and Canary Wharf.

- The School of Mathematical Sciences has an excellent reputation, with more than half of its research judged to be either world-leading or internationally excellent in the latest RAE. Members of the School publish over one hundred books and scientific papers each year.

- The School of Economics and Finance is one of the top economics schools in the country, ranked joint sixth in the most recent RAE. Members of the School are distinguished research economists who publish in the most influential journals and advise major institutions such as the World Bank and the Bank of England.

Programme outline
The programme consists of six core modules and two electives, and a dissertation project. You will also be offered a pre-sessional module in financial markets and economics providing a good opportunity to consolidate the prerequisite knowledge.

Core modules
- Computational Methods in Finance
- Foundations of Mathematical Modelling in Finance
- Investments
- Stochastic Calculus and Black Scholes Theory
- Advanced Asset Pricing Modelling
- Financial Derivatives

Option modules

- Time Series Analysis
- Econometrics A
- Investment Management
- Topics in Probability and Stochastic Processes
- Mathematical Statistics
- Advanced Computing in Finance
- Portfolio Theory and Risk Management
- Bayesian Statistics
- Risk Management in Banking
- Financial Econometrics

Teaching and assessment

- You will be assessed through a combination of coursework and examinations (depending on the modules), and on the research project.
- Written examinations take place in May and June and the dissertation project is assessed in September.

Entry requirements

- A good upper-second class honours degree or equivalent in mathematics, or in a subject with a substantial mathematical component: for example, mathematics, statistics, physics, chemistry, economics, computer science or engineering. However, no previous knowledge of finance is assumed.
- Where English is not your first language, IELTS 6.5 (or equivalent). For more information on international entry requirements, see page 151 or visit www.qmul.ac.uk/international

Further information

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

Staff profile:
Michael J Phillips

Lecturer in Applied Mathematics and Financial Mathematics

"My current research is in Random Matrix Theory (RMT), a field of applied mathematics which involves exploring the properties of matrices with randomly distributed elements. A particular interest of mine is investigating the (complex-valued) eigenvalues of non-Hermitian matrices, and determining how their statistical distributions depend on the precise structure of the matrices being considered.

"RMT finds many applications in physics and elsewhere; in fact, one particular class of matrices that I and my colleagues recently solved can be used to model certain features of Quantum Chromodynamics (QCD), the theory of the strong nuclear force. This helps to improve our understanding of the properties of highly dense matter, as found, for example, in the early universe.

"A major part of my role at Queen Mary involves lecturing in financial mathematics and computing. Prior to joining Queen Mary, I worked for many years as a quantitative analyst and software engineer in the City of London, developing pricing models for a wide range of financial products. This experience has helped me to ensure that the courses I teach here always have a highly practical focus, as well as being mathematically sound. They are therefore directly relevant to students planning future careers in investment or commercial banking. And the projects that I supervise will often involve numerical as well as analytical methods, giving students plenty of hands-on experience of the techniques that are actually used in financial institutions."

Degree programmes

MSc in Applied Statistics

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

This programme provides you with a thorough grounding in important areas of statistics and prepares you to apply this knowledge to real-world problems. It does not assume any in-depth statistical knowledge.

Overview

This programme will allow you to develop specialist knowledge and skills in applied statistics and will open up many opportunities for future employment. The main focus is on the theory and techniques which will be useful for a practising applied statistician in industry or research.

You will cover every stage of the process of providing statistical advice, from experiment design to data analysis, through to the practical aspects of consultation and report presentation. Statistical theories will be illustrated with real-world examples.

Why study with us

- Queen Mary has an international reputation for research in statistical methodology, medical statistics, econometrics and other areas of applied statistics.

- A pre-sessional module for those without a background in statistics covers areas including linear and generalised linear and multilevel models, multivariate statistics, statistical computing and the principles of statistical design of experiments.

- We offer a large shared office space and dedicated computer network for MSc students, fostering a friendly and co-operative learning environment.

Student profile: 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."

Programme outline and modules

The programme consists of eight core modules, plus a dissertation project. You will also be offered a pre-sessional module introducing those without a statistical background to the necessary statistical concepts.

Teaching and assessment

- You will be assessed through a combination of coursework and examinations (depending on the modules), and on the research project.

Entry requirements

- A good upper-second class honours degree or equivalent in a subject with a strong numerical component: for example, mathematics, statistics, biology, economics, computer science or engineering.

- Where English is not your first language we require IELTS 6.5 or equivalent. For more information on international entry requirements, see page 151 or www.qmul.ac.uk/international

Further information

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

Research

We welcome postgraduate students and visiting research fellows to undertake research in our areas of mathematics and statistics 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.

International students, please see the 'international students' section on page 150.

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, non-equilibrium 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.

Probability
The Probability 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 Keevash

Professor of Mathematics

"I am currently conducting a five year research project on Extremal Combinatorics supported by grants from the European Research Council (Starting Grant 239696) and from the Engineering and Physical Sciences Research Council (grant EP/G056730/1).

"One strand of this project develops methods for applying Hypergraph Regularity, which is an exciting recent advance in the field, building on the work of Abel Prize winner Endre Szemeredi on Graph Regularity.

"Key publications in this strand are: P. Keevash, *A hypergraph blowup lemma, Random Struct.* Alg. 39 (2011), 275--376 and P. Keevash and R. Mycroft, *A geometric theory for hypergraph matching, submitted.*

"At Queen Mary, postgraduate students have the opportunity to work with world-class researchers across a wide range of topics in Mathematics. There are many seminars creating an active research environment which is essential to the postgraduate experience.

"London is a perfect location for attracting international researchers, as well as being an exciting city to live in and enjoy when not studying."

Staff research interests

Konstantin Ardakov MMath PhD(Cambridge) Reader in Pure Mathematics
Non-commutative algebra, representation theory, arithmetic algebraic geometry

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

Adrian Baule Dipl-Phys(Münster) PhD(Leeds) Lecturer in Applied Mathematics/Financial Mathematics
Stochastic processes, time-series analysis, non-equilibrium statistical mechanics, applications in soft condensed matter, biophysics, and finance

Professor Christian Beck Diplom PhD(Aachen) Professor of Applied Mathematics
Dynamical systems: interplay between nonlinear dynamical systems, statistical mechanics and stochastic processes; spatiotemporal chaos

Barbara Bogacka MSc PhD(Poznan)
Reader in Statistics
Statistics: experimental designs for linear and
non-linear models of observations, optimization
of designs for parameter estimation, hypothesis
testing, and discriminating between models

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 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

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

David Ellis MA(Cantab) PhD(Cantab)
Lecturer in Pure Mathematics
Combinatorics: extremal combinatorics,
connections between combinatorics and other
areas (algebra, Fourier analysis, representation
theory, geometry)

Matthew Fayers MA PhD(Cantab)
Reader in Mathematics
Algebra: representation theory of groups and
algebras, Hecke algebras, Schur algebras

Professor Yan Fyodorov PhD DSci(St Petersburg)
Professor in Applied Probability
Random matrix theory and its applications,
statistical and quantum mechanics of
disordered systems

Alexander Gnedin PhD(Moscow)
Habilitation(Goettingen)
Professor in Applied Probability
Probability theory: combinatorial probability and
its applications in science and society, evolution
of big combinatorial structures, processes of
coagulation and fragmentation, species
sampling, random permutations,
exchangeability and stochastic symmetries

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
Deputy Head of School
Director of Research
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)
Professor of Mathematics
Head of School
Random matrices and operators: statistical properties of eigenvalues of non-Hermitian random matrices

Rainer Klages Diplom PhD(Berlin) Habilitation(Dresden)
Reader in Applied Mathematics
Director of Postgraduate Research Studies
Dynamical systems: applications of dynamical systems theory to non-equilibrium statistical mechanics, chaotic and fractal properties of transport, anomalous transport, diffusion in nanopores, the modelling of biological cell migration

Professor Vito Latora MA PhD(Catania)
Professor of Applied Mathematics
Complex systems, complex networks, dynamical systems, statistical physics

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: non-commutative differential geometry, quantum groups, Hopf algebras, representation theory, knot theory, non-commutative 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

Behrang Noohi PhD(MIT)
Lecturer in Mathematics
Higher/derived geometry, stacks and moduli spaces, higher group theory, string topology

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

Michael J Phillips MA(Cantab) PhD(Brunel)
Lecturer in Applied Mathematics and Financial Mathematics
Mathematical physics: random matrix theory, and its applications to classical and quantum physical systems, and finance

Professor Donald Preece MA(St Andrews) PhD(Kent)
Emeritus Professor
Design of experiments, combinatorics: nonorthogonal 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
Director of Taught Programmes
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, (non-standard) 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

Juan A Valiente Kroon BSc PhD (London)
Reader in Applied Mathematics
General relativity: mathematical aspects of the
theory including the initial value problem, global
aspects asymptotics, conformal methods and
invariant characterisations of solutions to the
Einstein field equations

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

Student Profile: 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. It is a big south-facing room with big windows. 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."

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 45 academic staff take pride in providing a first-class education for students, as well as taking part in groundbreaking research, and creating a stimulating and supportive study environment. We currently welcome around 30 new PhD students to the School 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 four 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 materials.

- 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 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.

For more about the research taking place in the School of Physics and Astronomy see pages 135 to 143.

Postgraduate resources

You will have access to a range of excellent facilities and resources. Comprehensive computing facilities are connected by a fast LAN to central College computers and from there to JANET and other WANs. Modern rooms are provided for molecular electronics and particle physics detector development. Research groups have a range of lithographic

Research quality indicators

The Research Assessment Exercise
Our School has an international reputation for excellence. In the most recent Research Assessment Exercise (RAE 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; examples include: £29m for SEPnet, £2.7m for PPRC, £1.4m for CRST, and £1m for CCMMP.

facilities, including ebeam 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 characterization equipment.

Scholarships/studentships

The School is offering 30 three/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 astronomy 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

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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: Maureen Willis

Studied: MSci, PhD Physics

Currently: Postdoctoral researcher at Fudan University, Shanghai

What is your favourite aspect of your job? Being paid to do work I am passionate about, while being able to experience different cultures and environments, from the lab in the university to a muon beam in Switzerland.

What did you enjoy about your time at Queen Mary? The friendly atmosphere and the readily available support. I also enjoyed the freedom and encouragement to develop my academic ability. The easy access to many aspects of research in the group during my PhD made it possible to gain a broad perspective of developments in the field and to develop my research skills.

What did you gain from your time here? As well as academic skills, I also developed transferable skills such as experience in communicating my work using presentations. I also furthered my knowledge in many aspects of the work involved in academic research, from computing and experimental techniques to the practical procedures behind the science.

MSc in Physics (EuroMasters)

Two years full-time

On this innovative two-year masters programme you will spend the first year attaining an in-depth knowledge in a particular area of physics or astrophysics, followed by a second year devoted to a supervised research project relating to this area.

Overview
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 combination of advanced taught programmes and an extended research training project will allow you to gain a deep understanding of your chosen area.

Why study with us?
- This programme is only available within partner universities in the South East Physics network (SEPnet). Queen Mary is the largest partner in this network, with a broad range of fundamental physics research centres.

- SEPnet 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)

- The programme will provide 120 ECTS credits, which will allow you to enter doctoral-level programmes in other EU countries.

Programme outline
There are around 50 modules to choose from on this programme. Many of these are associated with an intercollegiate programme taught by lecturers from Queen Mary, UCL, Kings and Royal Holloway.

Year 1: Either eight modules from the Intercollegiate MSci fourth year or from the MSc Astrophysics (see pages 132-133).

Year 2: Advanced Research Methods (30 credits) and an extended research-training project, including appropriate taught material and training, and a dissertation.

Teaching and assessment
- Teaching is delivered by lectures, some via video-conferencing.
- Modules will be assessed by exam. Some modules also have a coursework component. The research-training project is assessed by written dissertation.

Entrance requirements
- A minimum of an upper second class honours degree at undergraduate level in physics or equivalent.
- Equivalent of a postgraduate diploma in physics at a SEPnet partner for direct entry to the second year of the programme.
- Entry to either year is subject to the availability of appropriate courses and/or projects and the suitability of the applicant.
- International students, please see the 'International students' section on page 150.

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

Student profile: 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."

Degree programmes

MSc and Diploma in Astrophysics

Postgraduate Certificate in Astronomy and Astrophysics

**Nine months part-time
(two evenings/two afternoons/one afternoon
and one evening per week)**

These well-respected programmes provide a broad overview of the latest thinking in astrophysics, including both observational and theoretical topics with detailed coverage of active research areas. They provide a unique opportunity for graduates from a range of backgrounds to study astrophysics in depth.

Overview

These programmes cover a broad range of topics in modern theoretical and observational astrophysics, and research methods. You will develop analytical and communication skills, an understanding of complex datasets and how to present them, an in-depth knowledge of astrophysics and an appreciation of techniques for interpreting observations of remote objects. The Certificate, which essentially consists of the first year of the MSc/Diploma, is ideal for those who do not meet the higher-level MSc/Diploma entry requirements. The MSc and Diploma are identical except that MSc students also write a dissertation, involving a critical review of a current research topic and a related research project.

Why study with us?

- You will develop a comprehensive overview and solid foundation in modern astrophysics, including fascinating areas at the forefront of astrophysics research.

- This programme is suitable for students from a variety of academic backgrounds.

- If you perform well on the Certificate you may be accepted for transfer to the second year of the MSc in Astrophysics.

- The MSc is ideal preparation for PhD-level study.

Programme outline
Certificate
Four taught modules (each worth 15 credits)
from: Cosmology • Galaxy • Stellar Structure/Evolution • Extrasolar Planets & Astrophysical Disks • Solar System • Electromagnetic Radiation • Plasmas • Research Methods

MSc/Diploma
Eight taught modules (each worth 15 credits)
from: Cosmology • Galaxy • Stellar Structure/Evolution • Extrasolar Planets & Astrophysical Disks • Solar System • Electromagnetic Radiation • Plasmas • Research Methods

- Other modules, including from other University of London Colleges, may sometimes be substituted.

- Dissertation (60-credits) chosen from range of topics offered (MSc only).

Teaching and assessment

- Each module normally consists of a two-hour lecture and a one-hour module per week. You will receive comprehensive printed lecture notes.

- Assessment is by examinations in May/June. The MSc is also assessed by your dissertation.

- You may attend weekly seminars by visiting experts, postgraduate seminars hosted by current PhD students, and Royal Astronomical Society meetings.

Entrance requirements

- A degree (or international equivalent) in a subject with substantial mathematics or physics content. For the MSc/Diploma you will need a second class honours degree or above or a strong result in the Certificate.

- If English is not your first language, IELTS 6.5 or equivalent. For more information see page 151 or visit www.qmul.ac.uk/international

Further information

General enquiries:
email: astro-pg@qmul.ac.uk
Tel:+44(0)2078825030

Academic enquiries:
email: w.j.sutherland@qmul.ac.uk
www.astro.qmul.ac.uk/teaching/msc-astrophysics

Research

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

Scholarships

We offer a comprehensive set of scholarships to support students through their PhD. In 2012, we had 34 fully funded PhD positions available (fees plus living costs of £15,590 per annum) and we anticipate a similar number for the 2013 admissions cycle, from a variety of sources such as the EPSRC and STFC Doctoral Training Awards, The Principal's Scholarships, SEPNET, EPSRC Doctoral Training Centre in Plastic Electronics and the European Research Council.

The scholarships are available in the areas of experimental particle physics, string theory, condensed matter physics and astronomy. Many of the scholarships are open to international students and last between three and four years, depending on the funding source. We are also willing to support any student wishing to apply for their own scholarships (eg, from the British Council, their employer or government). We are also happy to take self-funded students.

Entry requirements

Students accepted for PhD 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 on page 150.

Research areas

Research in the School is focused in four areas:

- **Experimental Particle Physics**
- **Condensed Matter Physics**
- **Theoretical Physics**
- **Astronomy and Astrophysics**

Particle Physics Research Centre (PPRC)

Research in the PPRC is concentrated in the following core areas of particle physics (note – the experiments in which the group is involved are indicated in brackets):

- 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."

Research areas

for signs of new physics. We are working on searches for charged lepton flavour violating decays and on measurements of CPviolation, 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)
Reader
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)

CCMMP carries out experimental and theoretical research in condensed matter. Key themes include organic conductors, structure-property relations, and disordered and nanoscale materials. 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
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(Surrey) MInstP CPhys
Professor 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 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)
Professor
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

Dr Brian Wecht PhD (San Diego)
Lecturer
String theory, supersymmetric gauge theories

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; how will it evolve 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 energy and 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.

Research areas

Planetary Formation and Dynamics

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. The dynamics and evolution of planetary atmospheres are a major area of research, with particular focus on terrestrial planets and short-period extrasolar giant planets ('hot Jupiters').

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: Dynamical evolution of Saturn's rings and satellites through involvement in the highly successful NASA/ESA Cassini mission; formation and dynamics of satellite systems around the terrestrial and giant planets; formation of the Solar System; physical studies of asteroids, comets and Kuiper Belt objects.

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. 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

Timothy Clifton BSc PhD(Cantab)
Lecturer in Theoretical Cosmology
General relativity, gravitation and cosmology; constraining alternative theories of gravity; dark energy.

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)
Senior 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

Research areas

Professor Richard Nelson BSc PhD(Lond) FRAS
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
Emeritus 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

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) Online – using our online application form
This is our preferred method of application.

For further details of how to apply online, visit:
www.qmul.ac.uk/postgraduate/apply

2) Paper-based application

Download a paper-based application form at:
www.qmul.ac.uk/postgraduate/apply

The Admissions Office is happy to help you with any application queries you have, although if you would like more information on programme content, please contact the relevant department (see 'Further information' in the subject area sections in this prospectus).

If you are applying for a research programme, please contact the department in which you would like to study first.

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 webpages for the school you wish to apply to for up-to-date information on any deadlines.

If you are concerned about programmes filling up and would like advice on availability, contact:

Admissions Office
Freephone 0800 376 1800
From outside the UK: +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 list of their contact details, visit:
www.qmul.ac.uk/international/countries

Tuition fees

Funding your study

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 may become liable to pay a writing-up 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 for research students

Possible funding sources to consider include:

• Principal's Studentships (funded by Queen Mary, University of London)

• Research Council Studentships (eg EPSRC, STFC)

• Professional and Career Development Loans.

Principal's Studentships
(Home, EU and International students)
The College offers a number of these 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 2012/13 session).

Applicants for admission to PhD programmes to commence in the 2013/14 session will automatically be considered for the studentships in which they express an interest; there is no separate application form but deadlines will apply (see the website below). Details on the studentships available can be obtained directly from the School or at
www.qmul.ac.uk/postgraduate/funding

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 a major 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.

Details about the Research Council Studentships available for 2013/14 entry, including deadlines and how to apply, can be obtained from each institute or at www.qmul.ac.uk/postgraduate/funding

Professional and Career Development Loans (PCDLs) (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 lasting up to two years. 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 at www.direct.gov.uk and participating banks.

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, see www.csfp-online.org

China Scholarship Council scholarships (International students only)

Queen Mary offers PhD Scholarships with the China Scholarship Council (CSC). These are available to students from China for PhD study in various areas. Under this scheme Queen Mary provides a scholarship to cover all tuition fees and the CSC provides living expenses and one return flight ticket to successful applicants. 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 lasting up to two years. 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

There are also some school-specific scholarships and bursaries for international students. Please see 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 £9,000 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. £9,000 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 College, 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 College'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.

Alumni

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
Tel: +44 (0)20 7882 5533
email: bursaries@qmul.ac.uk

When you finish your studies at Queen Mary you will have something in common with over 75,000 former students around the world: a global network of people, from all walks of life, who share your experience as a Queen Mary student. Our alumni are among our best ambassadors. You can see how their studies have influenced some of their career choices at: www.qmul.ac.uk/alumni

As a member of the Queen Mary Alumni Network, we will send you our alumni magazine, QUAD, which includes news of the College and other alumni, as well as invitations to events and reunions worldwide. Our regular QM Alumni e-Newsletter also keeps you in touch with what is going on. You can also join our Queen Mary, University of London Alumni Network group on LinkedIn. You may also sign up for the Alumni card, which gives you a Queen Mary lifelong email address, discounted memberships of Qmotion gym and entitles you to use the College Library for reference purposes.

Contact
Alumni Relations and Fundraising Office
Tel: +44 (0)20 7882 7790
email: alumni@qmul.ac.uk
www.qmul.ac.uk/alumni

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 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 you feel at home.

Airport collection
New international students are offered a free airport collection service before the start of term in September 2013. 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 2013. 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 2012, 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. For further details, see: 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, visit: www.studenthealth.qmul.ac.uk

Living costs

International students will need to show evidence of having at least £9,000 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. £9,000 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, 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 2013/14, 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 146-147.

Representatives in your country

In many countries we have offices or 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 their families. To see when we will be visiting your region or for more information on any aspect of life at Queen Mary as an international student, see:
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 IBTOEFL 580 (internet-based IBTOEFL 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 some residential accommodation on summer programmes in the College's halls of residence.

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 IBTOEFL 87 or PTE Academic 51. For further information contact the Language Centre office or see www.sllf.qmul.ac.uk/languagecentre

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 Centre 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 Library 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:
English Language and Study Skills Office
Tel: +44 (0)20 7882 2827
email: elss@qmul.ac.uk
www.sllf.qmul.ac.uk/languagecentre

For more information about academic study support:
www.library.qmul.ac.uk/academic_study_tutorials

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. To book your place email: campustours@qmul.ac.uk

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 6th February 2013. To book your place: email: askthegradteam@qmul.ac.uk
www.qmul.ac.uk/pgopenevening

Contact us

Admissions Office
Freephone (UK callers only) 0800 376 1800
Tel: +44 (0)20 7882 5533
email: admissions@qmul.ac.uk

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 he 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.

Campus map

Mile End Campus Map Index

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ⓘ Information

Visitors who require further information or assistance please go to the Main Reception in the Queens' Building.

🚭 Please do not smoke on the campus.

These premises are alarmed and monitored by CCTV, please call security on 020 7882 5000 for more information.

📚 Library/bookshop
Fitness centre
🍺 Bar
Coffee place
🍴 Eatery

Ⓟ Staff Car Park
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£ Cash Machine

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www.qmul.ac.uk

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Are we the **right choice** for you?

Queen Mary
University of London

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 member of the Russell Group of leading UK universities

- We are a research-led institution with an international reputation. Our performance in the last Research Assessment Exercise confirmed this; we were ranked 11th overall in the UK (*The Guardian*)

- We are in the top five in the country in individual subject rankings (RAE 2008), including Linguistics (1st), Geography (1st), Drama (1st), English Language and Literature (2nd)

- We offer postgraduate students teaching and supervision by leading researchers in their academic fields – this makes for 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 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 the humanities, social sciences, law, engineering, science, medicine and dentistry

- We offer an international environment, with students from over 125 countries.

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

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.

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