MSc in Quantum Engineering

Department of Physics
Faculty of Natural Sciences

Handbook (2016/17)
Welcome to the College

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

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

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

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

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

As one of the best universities in the world, we are committed to inspiring the next generation of scientists, engineers, clinicians and business leaders by continuing to share the wonder of what we do through public engagement events. Postgraduate students, alongside our academics and undergraduate students, make a significant contribution to events such as our annual Imperial Festival and our term-time Imperial Fringe events – if you’re interested in getting involved then there will be opportunities for you to do so.
The Graduate School has several roles but our main functions are to provide a broad, effective and innovative range of professional skills development courses and to facilitate interdisciplinary interactions by providing opportunity for students to meet at academic and social events. Whether you wish to pursue a career in academia, industry or something else, professional skills development training will improve your personal impact and will help you to become a productive and successful researcher.

Professional skills courses for Master’s students are called “Masterclasses” and they cover a range of themes, for example, presentation skills, academic writing and leadership skills (http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters/). All Masterclasses are free of charge to Imperial Master’s students and I would encourage you to take as many as you can to supplement your academic training. The Graduate School works closely with the Graduate Students’ Union (GSU) and is keen to respond to student needs so if there is an area of skills training, or an activity that you would like us to offer, but which is not currently provided, please do get in touch (graduate.school@imperial.ac.uk).

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

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

Sue Gibson
Welcome from Dr Janet De Wilde, Head of Postgraduate Professional Development

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

Janet De Wilde
I am delighted to welcome you to Imperial, and to the Graduate Students’ Union (GSU). I hope that your time here will be fulfilling and valuable, and the GSU is here to try and facilitate this. Imperial College London is such a wonderful and transformative place that provides a unique and thrilling environment for research and for advanced studies, and the graduate students are a vital and valued part of the wider community of Imperial. Our graduate students are at the forefront of the research done. Therefore, at the GSU we ensure that the experience here fosters both academic achievement and personal development in our students.

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

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

Ahmed Shamso
gsu.president@imperial.ac.uk
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Part A – Overview / Introduction

1. Introduction

Welcome to the MSc in Quantum Engineering. The purpose of this handbook is to provide current and prospective students, and staff, with a detailed description of the course, including assessment and feedback mechanisms.

This handbook describes the framework of the course and its assessment but the Course Organiser and/or Course Committee may make changes to detailed procedures if the circumstances indicate this is desirable. Similarly, the Board of Examiners has absolute discretion to modify the criteria described in this handbook, although in practice this would only occur in exceptional circumstances. Students will be notified of any changes prior to their introduction.

The EPSRC Hub in Quantum Systems Engineering

The EPSRC Hub in Quantum Systems Engineering was established to provide multi-level interdisciplinary training and research in the field of quantum engineering (QE). The Hub supports a network of industry partners and other national centres (including the Imperial College hosted Centre of Doctoral Training in Controlled Quantum Dynamics). The training spans science, engineering, business and entrepreneurship and will focus on enabling graduates of the Hub to develop their careers in the emerging industries based on quantum engineering.

The MSc will provide engineering and physical science graduates with the technical and entrepreneurial training necessary for successful careers in the growing quantum technology industry by:

- learning the underpinning science behind quantum technology and systems engineering;
- developing the entrepreneurial and business skills necessary to support the UK’s QT industry;
- acquiring laboratory and appropriate computational and modelling skills through advanced, supervised practical training;
- develop research skills by undertaking a supervised independent project;
- practising the professional skills necessary for working effectively in an academic or business environment via team exercises and specialised courses; including communicating their work to others, team working, organisational skills and effective time management.

Graduate School

As soon as you begin your postgraduate studies at Imperial College you automatically become a member of the Graduate School. Membership means you become part of a wider community, broadening and enriching your academic experience.

http://www3.imperial.ac.uk/graduateschool
2. Programme Structure

The general structure of the MSc is as follows:

Term 1:

Compulsory courses:
- Tools for QE: Theory (Plato) – 6 ECTS;
- Tools for QE: Laboratory (Sauer) - 4 ECTS;
- Systems Engineering (Fisk) - 7 ECTS;
- Quantum Information and Post Quantum Cryptography (Ling/Mintert) – 5 ECTS;
- Atoms and Photons (Kim) – 5 ECTS;
- QE Laboratory (Tarbutt) – 3 ECTS.

Term 2:

Optional lecture courses (students choose 18 ECTS from the list below):
- Platforms for Quantum Technology (Thompson) – 6 ECTS;
- Information Theory (Ling) – 6 ECTS;
- Metrology and Navigation for QE (Oxborrow) – 6 ECTS;
- Frontiers in Photonics Technology (Tisch/Popov) – 6 ECTS
- Option offered elsewhere in the College (with the permission of the mentor and the director of the Quantum Engineering MSc) – 6 ECTS.

Term 3 and summer period: Project Work

Compulsory courses:
- Entrepreneurship – 2 ECTS.
- Innovation for QE (Business School) – 2 ECTS.

Compulsory project work:
- Project literature review and project plan.
- Industry internship
- Full time project work - 38 ECTS.

Projects are offered by academic staff based on their current research, and may be offered together with other research organisations. All the projects involve industrial partners. The projects available will be known in Term 1 and students will get to make a choice in Term 2. The list below shows some of the related topics:

- Laser development for quantum technology;
- Quantum metrology;
- Quantum communications;
- Atom Interferometry for navigation and sensing;
- Cavity-enhanced single photon sources for quantum information processing on waveguide chip;
- Next generation ion chips for scalable ionquantum technology;
- Quantum computing
Multiphoton interferometry.

Students give a progress report (normally a poster presentation). Feedback is provided on the oral progress report: all academic staff present fill in an assessment sheet and any comments are passed to the speaker. This assessment does not contribute to the provisional final mark.

The principal assessment is through the written project report, which is marked independently by two members of staff. The project reports are typically around 40-50 pages long (a maximum of 30,000 words is suggested). If you are concerned about the length of your report discuss it with your supervisor. The report must be submitted to Imperial College by 5pm on the date specified. Please note this deadline is strictly enforced. Students need only submit an electronic copy (in PDF format), which will be added to the archive of MSc reports. In addition there is a final project presentation, usually the week after the report is submitted, which contributes to the assessment of the project; all academic staff present complete an assessment sheet and their weighted marks contribute 20% to the marks for the report.

For the project report, follow the synopsis below:

- Document double spaced or 1.5 spacing
- Use a normal font such as 12 point Times (serif) or 11 point Arial (sans-serif).
- A4 page size
- Pages should be numbered sequentially
- There should be a Title page with:
  - Title of the Thesis
  - Your full name, as registered
  - Imperial College London, the name of your department
  - ‘Report submitted in partial fulfilment of the requirements of the degree of MSc of Imperial College London’
- Title page followed by Abstract on a separate page (max 300 words)
- Acknowledgement page

Graduate School Course
Students will also be expected to take relevant professional skills development courses offered by the Graduate School. These are usually offered in terms 1 and 2.

The timetable for the course will be distributed using iCalendar.

All Master’s students are required to undertake an online course in plagiarism awareness. More information about the course and how to enrol is available at: http://www.imperial.ac.uk/study/pg/graduate-school/professional-skills/masters/online/. Students on the MSc will need to have completed the course by November 30th 2016.
3. Requirements for Programme Completion

The MSc in Quantum Engineering consists of three elements:

- Core courses (accounting for 38% of the overall course mark);
- Option courses (accounting for 21% of the overall course mark);
- Project (accounting for 41% of the overall course mark).

To pass the course, the candidate must achieve an aggregate mark of 50% or higher in each element. In addition, they must have passed each component with a mark of 40% or higher.

A candidate can be considered for a Merit if the candidate has achieved an aggregate mark of ≥60%; and a mark of ≥60% for at least two of the elements and ≥50% for the other element.

A candidate can be considered for a Distinction if the candidate has achieved an aggregate mark of ≥70%; and a mark of ≥70% for at least two of the elements and ≥60% for the other element.

*The Examiners nevertheless reserve the right to make adjustments to the procedures given in this section in exceptional circumstances.*

Formal feedback to the students in each activity is by way of a letter grade indicating the percentage band of their attainment. The definition of the letter grades is given [here](#).

**DEADLINES:** Deadlines are absolute. *The Board of Assessors reserve the right not to mark reports submitted late.* Computer difficulties will not be accepted as excuses for late submission. Any extenuating circumstances (e.g. illness) should be discussed with the course organiser immediately.

**Resits**

Resits for the written examinations will be held at the next available opportunity, usually the following academic year. College regulations allow only one resit, otherwise the student is deemed to have failed the course. Students will retake the examinations for the specific subjects they have failed.

**Mitigation and Extenuating Circumstances**

The College will consider requests for mitigating and extenuating circumstances that may have affected a student’s performance in examinations or other areas of their course. Please note that claims for mitigating or extenuating circumstances should be made before, or no later than five days after, the examination or assessment and should be supported by documented evidence, if that is available.

To apply for mitigating circumstances please complete the appropriate form, which may be found at [http://www.imperial.ac.uk/physics/students/current-students/taught-postgraduates/](http://www.imperial.ac.uk/physics/students/current-students/taught-postgraduates/).
Please note that the information regarding your claim for mitigation or extenuation will remain confidential and will only be viewed by the advisory panel which will make a recommendation to the Board of Examiners about your request. You may indicate if there is any information which you DO NOT wish to be released to the Board of Examiners but bear in mind that the more information that is received by the Board the better able they will be to reach an informed decision.

Please contact the course organiser or your personal tutor for further information.
4. Calendar of Important dates

For the 2016-17 academic year the term dates are:

Autumn Term: Saturday 1\(^{st}\) October 2016 to Friday 16\(^{th}\) December 2016;
Spring Term: Saturday 7\(^{th}\) January 2017 to Friday 24\(^{th}\) March 2017;
Summer Term: Saturday 29\(^{th}\) April 2017 to Saturday 30\(^{th}\) September 2017.

For courses shared with other programmes, the examinations will be at the same time as those programmes. For the MSc specific courses, the examinations for the first term lecture courses will be in the week 9\(^{th}\) – 13\(^{th}\) January 2017. The examination for the optional courses will be between 1\(^{st}\) May and 5\(^{th}\) May 2017.

The Literature review and project plan should be submitted on Wednesday 22\(^{nd}\) March 2017.

The *Summer Project* written report should be submitted by Friday 22\(^{nd}\) September 2017. The presentations will be on Thursday 28\(^{th}\) September 2017.

The submission dates for the assessed laboratory coursework will be given during the course.
5. Ensuring your Programme is a Success – who does what?

The staff primarily responsible for administering the courses are:

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Person</th>
<th>Room No</th>
<th>Tel Ext.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Organiser</td>
<td>Prof. Myungshik Kim</td>
<td>EE1202</td>
<td>47754</td>
</tr>
<tr>
<td>Board of Examiners</td>
<td>Dr. Bruno Clerckx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr. Mark Oxborrow</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>External Examiner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postgraduate Welfare Advisor</td>
<td>Dr. Arnaud Czaja (a.czaja)</td>
<td>726</td>
<td>41789</td>
</tr>
<tr>
<td></td>
<td>(Huxley)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Postgraduate Student Representative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Careers Advisor</td>
<td>Prof. Lesley Cohen</td>
<td>B902</td>
<td>47598</td>
</tr>
<tr>
<td>Department Director of Postgraduate Studies</td>
<td>Prof. Stefan Maier</td>
<td>H903</td>
<td>46063</td>
</tr>
<tr>
<td>MSc External Examiner</td>
<td></td>
<td></td>
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</table>

Email addresses are the name in brackets added to @imperial.ac.uk

To call a College number from outside, dial 020 759 plus the Internal phone number (above).

The Hub Management team will meet regularly with each cohort (during regular lunches in their 1st year and in 2-4 years). This has been established as a best practice among CDTs at Imperial. The Course Director will meet all 1st year students individually each term. The management team and student reps will convene monthly to discuss all matters of the Hub.

The Physics Masters Committee has overall responsibility for the Masters courses in the Department. The Director of Postgraduate Studies chairs the committee, and the course organisers and the student representatives are members of the committee. It meets twice a year.
6. Expectations

General Regulations for students

The College’s regulation for students may be found at http://www3.imperial.ac.uk/registry/proceduresandregulations

Code of Student Discipline

This Code of Student Discipline provides for the hearing of complaints concerning breaches of discipline by students, and for rights of appeal where appropriate, and sets down the penalties that may be imposed, including termination of membership of the College http://www.imperial.ac.uk/admin-services/secretariat/

Attendance

The College monitors the attendance of all its students. Students are requested to notify lecturers and the Course Organiser if they become ill. Students are required to provide a medical certificate if they are absent for 3 days or more, including during the summer project. If a student misses an examination because they are ill it is essential that they obtain a medical certificate.

Employment during studies

Please note the College’s policy regarding part time employment during your MSc course https://workspace.imperial.ac.uk/registry/Public/Procedures%20and%20Regulations/Policies%20and%20Procedures/Student%20Employment%20During%20Studies.pdf

Progress and Performance

All assessments during the lecture courses and laboratory should be returned within two weeks with a letter grade and comments from the marker. The dissertation is marked after the end of the academic year; please contact the course organiser for details on how to get feedback on the report. The grades are related to the marks by the following table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td>$m \geq 80%$</td>
</tr>
<tr>
<td>A</td>
<td>$70% \leq m \leq 79.9%$</td>
</tr>
<tr>
<td>B</td>
<td>$60% \leq m \leq 69.9%$</td>
</tr>
<tr>
<td>C</td>
<td>$50% \leq m \leq 59.9%$</td>
</tr>
<tr>
<td>D</td>
<td>$40% \leq m \leq 49.9%$</td>
</tr>
<tr>
<td>F</td>
<td>$M \leq 39.9%$</td>
</tr>
</tbody>
</table>

(‘E’ is not used)

Complaints

Imperial College aims to give the highest specialised instruction and service to all its students, however, in some cases it recognises that students may not always be satisfied with the service that they have received. If you wish to raise a concern, you should first
seek advice from your student representatives and raise the matter with the individual concerned. If you are not satisfied with the outcome, you should consult the College’s Registry website which provides clear and consistent procedures that indicate how you can take your comments further:

http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/complaintsappeals
7. **Blackboard (VLE)**

Some of the course material may be published on Blackboard and lectures shared with the UG course recorded using Panopto [http://learn.imperial.ac.uk](http://learn.imperial.ac.uk). You should be registered for the appropriate courses soon after you arrive; if you wish to be registered for further courses please contact andrew.williamson@imperial.ac.uk.
8. Campus information

General information about the College, including maps of the South Kensington campus, may be found at [http://www3.imperial.ac.uk/campusinfo/](http://www3.imperial.ac.uk/campusinfo/).

Directions

Imperial College is located just behind (south of) the Albert Hall in South Kensington. The nearest tube stations are South Kensington and Gloucester Road on the District/Circle Line and High Street Kensington on the Circle Line. South Kensington and Gloucester Road are also on the Piccadilly Line which goes directly to Heathrow Airport.

The Department of Physics is located at the Blackett Laboratory, on the corner of Queen’s Gate and Prince Consort Road (the entrance is on this road).

Health, Welfare and Student Support

[http://www.imperial.ac.uk/students/student-support/](http://www.imperial.ac.uk/students/student-support/)

The College Health Service may be found at 40 Princes Gardens. Their telephone number is Ext. 4-9375/6. For emergencies call Ext. 4444. Students may use the Health Service free of charge during normal working hours; the Health Service is open from 8:00am to 6:30pm weekdays during term time (but it is closed after 1pm on Tuesdays), and 8:00am to 5:00pm out of term. Appointments may be made by calling the above number. Otherwise, there is a triage clinic (appointments not necessary) from 8:30am to 10am.

We strongly recommend that you register with an NHS general practitioner as soon as you arrive at Imperial, even if you do not normally need to see a doctor. Students who live away from College should register with an NHS general practitioner local to their place of residence, in case they need the doctor to visit them at home, or for medical advice out-of-hours.

Dental treatment is also provided at the Health Service. Appointments are usually necessary (call 0207 589 6623). It is generally necessary to pay for dental treatment, although students may be eligible for subsidised treatment.

If travelling elsewhere in the European Union, you would be advised to obtain an EHIC card [https://www.ehic.org.uk/Internet/home.do](https://www.ehic.org.uk/Internet/home.do) prior to your travel, as this will enable you to receive medical treatment at reduced cost. The EHIC is available to all persons resident in the United Kingdom, but non European Union students will need longer to apply.

The contact details for other welfare services are:

<table>
<thead>
<tr>
<th>Service</th>
<th>Internal Tel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency assistance (Medical, Security and Fire, Police, Ambulance)</td>
<td>4444 (internal)</td>
</tr>
<tr>
<td>The Health Centre</td>
<td>020 7584 6301 or 49375</td>
</tr>
</tbody>
</table>
The Student Hub (Accommodation) 49444
(The Student Counselling service 49637
Chaplaincy (Religious support, including other major faiths) 49600
Students Union 48060

Sports

The College Sports Centre can be found at 7 Prince's Gardens. Details of facilities, opening times and other information can be found at http://www3.imperial.ac.uk/sports/ethos.

Security and Emergencies

Emergencies of all types may be reported to Ext. 4444. There are First Aid boxes around the Department and in the laboratories, and your safety induction and literature should give you details on First Aid procedures.

Petty theft happens from time to time. Don't leave valuables lying around and always close and lock the door, even if you go out for just a short time. Make sure that the doors to any rooms containing computers are properly locked if you are one of the last to leave in the evenings or at weekends. Unfortunately, some thefts have been from locked offices, so if you have a laptop, either take it home each night or lock it in a secure place. If you see anyone at all suspicious, call security at the above number.
Part B – What you can expect

9. Facilities

Student’s Union

All students at Imperial College are members of the Imperial College Union http://www.imperialcollegeunion.org/ and the Graduate Student’s Union https://union.ic.ac.uk/presidents/gsu/. As well as social, sporting and cultural events the Union offers other services such as welfare and housing advice.

The Physics Department has a Postgraduate Committee which represents masters and PhD students and also organises a range of social events throughout the year.

If you wish to represent your fellow students to the College details on how to do so may be found at https://www.imperialcollegeunion.org/representation.

Computing

General support and information on using computers at Imperial College is the responsibility of ICT (Information and Communication Technologies division). Information for new students can be found at http://www.imperial.ac.uk/admin-services/ict/ under ‘New to Imperial?’

All new members of College will be given a College username and email address. The induction pack given to you at the start of your studies will explain how to activate your account – please note you will need your CID number to do this.

General help on computing matters can be obtained from service desk. Their website is also linked from http://www.imperial.ac.uk/admin-services/ict/. Their email address is Service.Desk@imperial.ac.uk or they can be contacted by phone on ext. 49000.

Students can use any of the college’s public area PCs. The main public areas in College which are available to MSc students are in the central library on level 2 and the undergraduate computing lab on level 3 Blackett, although undergraduates have priority of use in the latter. Some Halls of Residence have their own computer suites available for residents.

The computer suites have network printers for use by students. Each student has an account to pay for their printing and you must have sufficient credit in this account to print your job. When starting, your account will be given some credit – extra credits can be obtained from the card loaders throughout College.

The College has a wireless network, and guidance on connecting your computer to the network can be found at http://www.imperial.ac.uk/admin-services/ict/ in one of the quick links.

Please note that if you are using your own computer on a College network you are still bound by the College’s terms and conditions of use, which you will have to agree to prior to
activating your account and which can be seen at https://www.imperial.ac.uk/ict/activateaccount/.

Calculators

The College Board of Graduate Studies has determined that only College-owned approved non-programmable calculators can be used in the written examinations. The Physics Department has approved and can provide calculators, which use algebraic logic. Appropriate arrangements will be made for students wishing to use RPN calculators. However, in all cases, only College-owned calculators may be used in the written examinations and therefore students are advised to either purchase an appropriate calculator or practise on a College-owned calculator before the written examinations.

Library

The Central Library is next to the Sherfield Building. The catalogue may be accessed from terminals in the Central Library and over the web (starting from the College home page). The Central Library also houses the Haldane Library, with a good general collection (fiction and non-fiction) and a music and DVD library.

Electronic journals are available via the library website:

http://www3.imperial.ac.uk/library

Note that the Physics Department does not have its own library.

Food and Drink

Lunch can be bought in the Student Common Room, on Level 2 of the Sherfield Building or downstairs in the Main Dining Room.

Tea, coffee and sandwiches are available in the Physics Common Room, on Level 8 of the Blackett Lab (which also offers an impressive view over London). Due to their large number, MSc students are unfortunately not permitted to use the Maths Department Common Room on Level 5 of the Huxley Building or the Senior Common Room in the Sherfield Building.

A number of sandwich shops, restaurants and pubs, at a range of prices, may be found on Gloucester Road (one block west of Queen’s Gate), and around the tube station at South Kensington. Beit Quad and Southside have student bars.

Mail

The Department’s postal address is:

Physics Department,
Imperial College London,
South Kensington campus,
London, SW7 2AZ,
UK
If you have any mail to be delivered to the Department, please use your name together with the above address. The mail will be delivered to the pigeonholes outside the Optics Cluster Office.

**Telephone**
The general college number is 020 7589 5111. The College operator may be obtained by dialling 0. Five-figure internal numbers may be dialled directly on the phone. All extension numbers prefixed with a 4 may be dialled directly by external callers using 020 7594-XXXX, where XXXX is the last four digits of the extension. Extension numbers prefixed with a 5 do not have the direct dialling facility. Use the “People” tab (top right, next to the Search textbox) on the College website to find telephone numbers and offices of members of College. Microsoft Outlook also has contact details for the staff and students.

...and when you finish the College has an alumni network
http://www.imperial.ac.uk/alumni/.
10. Teaching and Supervision

The College standard working day is used, with 50-minute lectures commencing on the hour, starting at 09:00 at the earliest. Most MSc lectures are in the CDT Centre in the Sherfield Building. The laboratory work is carried out in the MSc laboratory space in Blackett 418.

Safety

In a course that makes use of high-voltage power supplies, lasers and chemicals, safety is of paramount importance. All students are issued with the current version of the Physics Department Safety Booklet at the start of the MSc course, and all students are required to attend the College Laboratory Safety lecture and to pass the online Laser Safety course http://www.imperial.ac.uk/safety/lasersafety/. This is necessary in order to be able to register for the use of lasers in the laboratory. The Risk Assessment Foundation Training course http://www3.imperial.ac.uk/staffdevelopment/safety/index/raft, which teaches how to assess the potential hazards of an experiment, is also compulsory and you will need to prepare a risk assessment for some experimental equipment you design as part of the laboratory course.

It is important to bear in mind safety issues when working in the laboratory, particularly when working with laser beams. Detailed guidance on safety in the MSc laboratory is issued to students with the rest of the laboratory details, and College guidance on safety may be found here.

Projects may be taken in research group laboratories where high-power laser beams or other potentially dangerous equipment such as high-voltage power supplies are routinely in use. Students must read, sign and follow the safety guidelines agreed for each laboratory covering electrical, chemical and laser safety as appropriate.
11. Assessment

The procedures for the examinations and the criteria for completing the courses are governed by the College’s Academic and Examination arrangements, http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations. The College’s policy on religious obligations in assessments may be found at http://www3.imperial.ac.uk/registry/exams.

Professional skills

This course involves advice on and activities valued in a working environment (i.e., careers advice, presentation skills). The Graduate School offer a range of courses and these will be publicised during the year. Details can be found at http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters.
12. Pastoral and Academic Support

Student welfare is of particular concern to members of academic staff in departments and divisions, and to warden teams in Halls: https://workspace.imperial.ac.uk/registry/public/Procedures%20and%20Regulations/Quality%20Assurance/Academic%20and%20Pastoral%20Support%20of%20Postgraduate%20Taught%20Students.pdf.

Your first point of contact to raise queries or issues should always be your course team, details can be found in 5. However, all students also have confidential access - independent of department or division - to the College Tutors regarding academic issues, and all aspects of pastoral care and discipline within the College.

http://www.imperial.ac.uk/students/student-support/college-tutors-and-departmental-support/
http://www.imperial.ac.uk/physics/students/current-students/student-welfare/

The Postgraduate tutor in the Physics Department is Dr Arnaud Czaja (a.czaja@imperial.ac.uk – ext. 41789), who is available to discuss any matter, personal and academic, in confidence. In addition, the Department’s Senior Tutor Prof Jing Zhang (ph.stutor@imperial.ac.uk) may also be able to assist.

If you wish to discuss matters with a female member of staff please contact Prof Lesley Cohen (l.cohen@imperial.ac.uk) or Dr Yvonne Unruh (y.unruh@imperial.ac.uk) who may be able to assist.

Other useful sources of support offered by the College are:

http://www3.imperial.ac.uk/studenthub (for general assistance)
http://www3.imperial.ac.uk/academic-english (for English language support)
http://www.imperial.ac.uk/study/international-students (for international students)
http://www3.imperial.ac.uk/registry (for academic matters)
http://www3.imperial.ac.uk/careers (for careers advice)
13. Evaluation and Quality Assurance

The Department is keen to gather the student’s view of their experience and learning while they are here, and to use their feedback to improve the delivery of the courses. The Departmental body with responsibility for the provision of Postgraduate Taught courses is the Postgraduate Masters Committee (PMC), chaired by the Director of Postgraduate Studies.

Postgraduate Masters Committee

The membership of the PMC consists of the course organisers, the student representatives for each masters course and the Directors of Postgraduate Studies and of Undergraduate Studies. The PMC typically meets twice a year. Each Masters course must elected a student representative early in the autumn term to serve on the PMC. Their role is to inform the PMC of the concerns of the students and to assist in implementing any changes proposed.

https://www.imperialcollegeunion.org/representation

As well as the formal monitoring system, students are encouraged to raise any concerns with the course organiser as they arise.

Course Questionnaire

Your feedback is important to your department, the College and Imperial College Union. Whilst, there are a variety of means to give your feedback on your Imperial experience, the following College-wide surveys give you regular opportunities to make your voice heard:

- PG SOLE lecturer/module
- Student Experience Survey (SES)

The PG SOLE lecturer/module survey runs at the end of the Autumn and Spring Terms. This survey is your chance to tell us about the modules you have attended and the lecturers who taught them. Run at the same time as the Autumn Term PG SOLE is the Union’s Student Experience Survey (SES). This survey will cover your induction, welfare, pastoral and support services experience. During December you will receive an email in your Imperial College account with a link to the surveys.

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

If you would like to know more about any of these surveys or see the results from previous surveys, please visit: http://www3.imperial.ac.uk/registry/proceduresandregulations/surveys

For further information on surveys please contact the Registry’s Surveys Team on surveys.registriesupport@imperial.ac.uk

College Monitoring of Courses
Independent of the above, the College reviews all masters courses and ensures that they are compliant with statutory requirements and best practice. Details on the processes may be found at

http://www.imperial.ac.uk/study/pg/graduate-school/quality-assurance/

For further information on surveys please contact the Registry’s Surveys Team on surveys.registysupport@imperial.ac.uk.
Part C – The Modules

14. Core Module:

Details of the core modules are given in the course modules handbook.

15. Option Modules:

Details of the optional modules are given in the course modules handbook.
16. Marking criteria and template for written work
These will be provided at the start of each course.

17. Marking criteria and template for dissertation
These will be provided at the start of the course.

18. Options Module Choice Form
This will be provided at the start of the course.

19. Graduate School
All MSc students are enrolled in the Graduate School, which is responsible for providing Professional Skills courses and for Quality Assurance. You can find more information about the Graduate School at http://www3.imperial.ac.uk/graduateschools.

20. Study guide for Master’s students
The College has produced a study guide specifically for masters students. It can be seen at https://workspace.imperial.ac.uk/college/public/pdfs/ISGMasters.pdf

21. The Registry Department
The Registry Department maintains the official records of your studies, and can provide much needed documentation before, during and after your studies. Details may be found at http://www3.imperial.ac.uk/registry/abouttheregistry
APPENDIX I: Policy on Scientific Misconduct

The College considers any allegation of scientific misconduct to be a matter of great concern and will investigate any such allegation fully. Given its international reputation and status, the College has a responsibility to the scientific community and to the public at large and therefore, where appropriate, will make public the outcome of any such investigation.


Definitions

The College has adopted the Royal College of Physicians’ definitions of scientific misconduct as including piracy, plagiarism and fraud. The following definitions give indicative descriptions of the types of activity covered by this regulation. These descriptions are neither exclusive nor exhaustive:

- Piracy is the deliberate exploitation of ideas and concepts from others without acknowledgement.
- Plagiarism is the copying of ideas, data or text (or a combination of these) without permission or acknowledgement.
- Fraud involves deception—usually, but not exclusively, the invention of data. This could also include the omission from analysis and publication of inconvenient components of a data set.

Other types of scientific misconduct may be separately defined, but the College views them as combinations or sub-types of those defined above. In addition to scientific misconduct, these procedures will also apply to cases of scientific negligence.

Procedures for the Investigation of Allegations of Research Misconduct

See the ordinances at http://www.imperial.ac.uk/admin-services/secretariat/.

STATEMENT ON PLAGIARISM

You are reminded that all work submitted as part of the requirements for any examination (including coursework) of Imperial College and the University of London must be expressed in your own words and incorporate your own ideas and judgements.

Plagiarism, that is, the presentation of another person’s thoughts or words as though they were your own, must be avoided, with particular care in coursework, essays and reports written in your own time. Note that you are encouraged to read and criticise the work of others as much as possible. You are expected to incorporate this in your thinking and in your coursework and assessments. But you must acknowledge and label your sources.

Direct quotations from the published or unpublished work of others, from the internet, or from any other source must always be clearly identified as such. A full reference to their source must be provided in the proper form and quotation marks used. Remember that a series of short quotations from several different sources, if not clearly identified as such, constitutes plagiarism just as much as a single unacknowledged long quotation from a single source. Equally, if you summarise another person’s ideas or judgements, figures, diagrams or software, you must refer to that person in your text, and include the work referred to in
your bibliography. Departments are able to give advice about the appropriate use and correct acknowledgement of other sources in your own work.

The direct and unacknowledged repetition of your own work which has already been submitted for assessment can constitute self-plagiarism. Where group work is submitted, this should be presented in a way approved by your department. You should therefore consult your tutor or course organiser if you are in any doubt about what is permissible. You should be aware that you have a collective responsibility for the integrity of group work submitted for assessment.

The use of the work of another student, past or present, constitutes plagiarism. Where work is used without the consent of that student, this will normally be regarded as a major offence of plagiarism.

Failure to observe these rules may result in an allegation of cheating. Cases of suspected plagiarism will be dealt with under the College’s Examination Offences Policy and may result in a penalty being taken against any student found guilty of plagiarism.

Cheating Offences Policy and Procedures
http://www3.imperial.ac.uk/registry/exams/examoffences

Plagiarism advice for postgraduate taught course (Master's) students
http://www.imperial.ac.uk/admin-services/library/learning-support/plagiarism-awareness/

TurnitinUK Plagiarism Detection Service at Imperial College
http://www.imperial.ac.uk/admin-services/ict/self-service/teaching-learning/elearning-services/
APPENDIX II: Students with disabilities, specific learning difficulties, long-term health issues

At Imperial College we recognise that studying at university can be a challenge, especially if you have a disability. We are keen that you have every opportunity to fulfil your potential and graduate with the degree you deserve. It is therefore important that you let us know about any disability, specific learning difficulty or health problem as soon as possible so that we can give expert advice and support to enable you to do this.

Some people never think of themselves as having a disability, but students who have experienced any of the issues listed below have found that a little extra help and support has made all the difference to their study experience.

- Specific learning difficulties (such as dyslexia, dyspraxia, AD[H]D)
- Autistic spectrum disorder (such as Asperger’s)
- Deafness or hearing difficulties
- Long term mental health difficulties (such as chronic anxiety, bipolar disorder, depression)
- Medical conditions (such as epilepsy, arthritis, diabetes, Crohn’s disease)
- Physical disabilities or mobility impairments
- Visual difficulties

Where to find help:

1. **Your Disability Liaison Officer** (DLO) Dr Andrew Williamson (andrew.williamson@imperial.ac.uk, Blackett Laboratory, Room 316, Tel: 020 7594 7631) is your first point of contact within your department and is there to help you with arranging any support within the department that you need. The DLO is also the person who will apply for additional examination arrangements on your behalf. You need to contact him without delay if you think that you may need extra time or other adjustments for your examinations. [http://www3.imperial.ac.uk/registry/exams/specialexamarrangements](http://www3.imperial.ac.uk/registry/exams/specialexamarrangements)

2. **Disability Advisory Service**: [http://www3.imperial.ac.uk/disabilityadvisoryservice](http://www3.imperial.ac.uk/disabilityadvisoryservice)
   The Disability Advisory Service works with individual students no matter what their disability to ensure that they have the support they need. We can also help if you think that you may have an unrecognised study problem such as dyslexia. Our service is both confidential (information about you is only passed on to other people in the university with your agreement) and individual in that any support is tailored to what you need.

   Some of the sorts of things we can help with are:

   - Being an advocate on your behalf with others in the College such as your departmental liaison officer senior tutor or exams officer, the accommodation office or the estates department
   - Checking that your evidence of disability is appropriate and up-to-date
   - Arranging a diagnostic assessment for specific learning difficulties
   - Help with applying to the College for the cost of an assessment
   - Help with your application for the Disabled Students Allowance (DSA) see below
• Helping students not eligible for the Disabled Students Allowance in obtaining support from other sources
• Help with arranging extra Library support
• Supporting applications for continuing accommodation for your second or later years

3. **Disabled Students Allowance:**
[http://www3.imperial.ac.uk/disabilityadvisoryservice/supportatimperial/funding](http://www3.imperial.ac.uk/disabilityadvisoryservice/supportatimperial/funding)
Students who are home for fees and who have a disability can apply for a grant called the Disabled Students Allowance which can pay any extra costs that are a direct result of disability. This fund is not means-tested and is also a grant not a loan so any home student with a disability can apply and will not be expected to pay it back. Remember students with unseen disabilities such as mental health difficulties, dyslexic type difficulties or long term health problems are also eligible for this fund.