



DEPARTMENT OF PHYSICS

# **POSTGRADUATE TAUGHT STUDENT HANDBOOK**

## **MSc in Physics Euromasters**

2013/2014

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Department of Physics  
Royal Holloway, University of London  
Egham Hill, Egham  
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## Term Dates

### Autumn Term

#### Monday 23 September 2013 – Friday 13 December 2013

New Students: Induction	24 September 2013
Returning Students:	26 September 2013
First day of lecturing	30 September 2013
Last day of lecturing	13 December 2013

### Spring Term

#### Monday 13 January 2014 – Friday 28 March 2014

First day of lecturing	13 January 2014
Last day of lecturing	28 March 2014

### Summer Term

#### Monday 28 April 2014 – Friday 13 June 2014

### Disclaimer

This document was published in September 2013 and was correct at that time. The Department reserves the right to modify any statement if necessary, make variations to the content or methods of delivery of programmes of study, to discontinue programmes, or merge or combine programmes if such actions are reasonably considered to be necessary by the College. Every effort will be made to keep disruption to a minimum, and to give as much notice as possible.

**An electronic copy of this handbook can be found on your Departmental website (<http://www.rhul.ac.uk/physics/informationforcurrentstudents/home.aspx>) where it will be possible to follow the hyperlinks to relevant webpages.**

# Contents

<b>TERM DATES</b> .....	<b>2</b>
<b>1 INTRODUCTION TO THE DEPARTMENT</b> .....	<b>5</b>
1.1 WELCOME .....	5
1.2 HOW TO FIND US: THE DEPARTMENT .....	5
1.3 HOW TO FIND US: THE STAFF .....	5
1.4 HOW TO FIND US: THE DEPARTMENTAL OFFICE .....	6
1.5 THE DEPARTMENT: PRACTICAL INFORMATION .....	6
<b>2 COMMUNICATION</b> .....	<b>7</b>
2.1 EMAIL .....	7
2.2 POST .....	8
2.3 TELEPHONE AND POSTAL ADDRESS .....	8
2.4 NOTICE BOARDS .....	8
<b>3 TEACHING</b> .....	<b>9</b>
3.1 DATES OF TERMS .....	9
3.2 ATTENDANCE REQUIREMENTS .....	9
3.3 NOTIFICATION OF ABSENCE .....	10
3.4 MEETINGS .....	11
3.5 DISCIPLINARY ACTION .....	12
3.6 WITHDRAWAL OF VISA .....	12
<b>4 DEGREE STRUCTURE</b> .....	<b>13</b>
4.1 COURSE REGISTRATIONS .....	14
<b>5 FACILITIES</b> .....	<b>15</b>
5.1 LIBRARIES .....	15
5.2 PHYSICS RESOURCES ROOM (T118) .....	15
5.3 PHOTOCOPYING, PRINTING AND COMPUTING .....	15
5.3.1 <i>Photocopying</i> .....	15
5.3.2 <i>Printing</i> .....	16
5.3.3 <i>Computing</i> .....	16
5.4 LOCKERS .....	16
5.5 TELESCOPES .....	16
5.6 MATHEMATICA .....	17
<b>6 SEMINARS, COURSEWORK AND PROJECTS</b> .....	<b>17</b>
6.1 SEMINARS, COLLOQUIA AND GUEST LECTURES .....	17
6.2 COURSEWORK .....	17
6.3 THE 1 <sup>ST</sup> YEAR PROJECT .....	17
6.4 THE 2 <sup>ND</sup> YEAR RESEARCH PROJECT .....	18
<b>7 ASSESSMENT INFORMATION</b> .....	<b>20</b>
7.1 ILLNESS OR OTHER EXTENUATING CIRCUMSTANCES .....	20
7.2 SUBMISSION OF WRITTEN WORK .....	21
7.3 EXTENSIONS TO DEADLINES .....	21
7.4 PENALTIES FOR LATE SUBMISSION OF WORK .....	21
7.5 ANONYMOUS MARKING AND COVER SHEETS .....	22
7.6 PENALTIES FOR OVER-LENGTH WORK .....	22
7.7 RETURN OF WRITTEN COURSEWORK .....	22
7.8 ASSESSMENT OFFENCES .....	22
7.9 PLAGIARISM .....	23

7.10	MARKING OF ILLEGIBLE SCRIPTS .....	23
7.11	PROGRESSION AND AWARD REQUIREMENTS .....	23
	OUTCOMES OF COURSE UNIT ASSESSMENT .....	24
7.12	EXAMINATION/ASSESSMENT RESULTS .....	25
<b>8</b>	<b>STUDENT SUPPORT.....</b>	<b>25</b>
8.1	STUDENTS IN NEED OF SUPPORT (INCLUDING STUDENTS WITH SPECIAL NEEDS) .....	25
8.2	STUDENT-STAFF COMMITTEE .....	25
8.3	POSTGRADUATE COMMITTEE.....	26
8.4	STUDENTS' UNION .....	26
8.5	CAREERS INFORMATION .....	26
8.6	NON-ACADEMIC POLICIES .....	26
8.7	COMPLAINTS AND ACADEMIC APPEALS PROCEDURE .....	26
<b>9</b>	<b>HEALTH AND SAFETY INFORMATION .....</b>	<b>27</b>
9.1	CODE OF PRACTICE ON HARASSMENT FOR STUDENTS .....	27
9.2	LONE WORKING POLICY AND PROCEDURES .....	27
<b>10</b>	<b>EQUAL OPPORTUNITIES STATEMENT AND COLLEGE CODES OF PRACTICE .....</b>	<b>27</b>
10.1	EQUAL OPPORTUNITIES STATEMENT .....	27
10.2	COLLEGE CODES OF PRACTICE .....	28
	<b>APPENDIX 1: LECTURE COURSES .....</b>	<b>29</b>
	<b>APPENDIX 2: EUROMASTERS PROGRAMME SPECIFICATION .....</b>	<b>30</b>
	<b>APPENDIX 3: COURSE SPECIFICATION – PH5210 .....</b>	<b>37</b>
	<b>APPENDIX 4: COURSE SPECIFICATION - 2<sup>ND</sup> YEAR RESEARCH PROJECT .....</b>	<b>40</b>
	<b>APPENDIX 5: MEMBERS OF STAFF AND THEIR AREAS OF RESPONSIBILITY .....</b>	<b>42</b>
	<b>APPENDIX 6: PHYSICS ACADEMIC STAFF AND THEIR CONTACT DETAILS .....</b>	<b>44</b>

# 1 Introduction to the Department

## 1.1 Welcome

A warm welcome to the Department of Physics. The MSc in Physics Euromasters Student Handbook (this document) is the main source of information and advice provided by each department in the College to its own students. In the following pages you should find all of the essential information that a student studying for a Euromasters degree in the Department of Physics should need. Web links to further sources are also listed.

The handbook should be read in full by every Euromasters student of physics. You will find you need to become very familiar with some of the information for use on a day to day basis. Other information will not be needed anywhere near as frequently and you will simply need to recall that its source is the MSc in Physics Euromasters Student Handbook, referring back as and when questions arise, so please store this document in a safe place after you have read it. An up to date electronic version can be found on the Departmental web site. We are aware that the reading of this document will take some time so, without loss of accuracy or completeness, we have endeavoured to be as succinct as possible.

Please do not hesitate to ask questions of academic or departmental office staff, but first please ensure that you have referred to this handbook. If you spot any errors or there is any need for clarification please let the office staff know. While we have made every effort to ensure that such events are rare, we are not infallible.

I hope you very much enjoy the coming academic year, we aim to make it as fulfilling as possible.

Professor Jon Goff  
Director of Graduate Studies

## 1.2 How to find us: the Department

The Physics Department is housed in the Tolansky (room numbers Txxx) and Wilson (Wxxx) Laboratories. This can be found on the College [campus map](#) as buildings 21 and 22. Most of the academic, research, technical and administrative staff are based here. The first number of the room code denotes the floor level, 0, 1, or 2.

Student parking is limited and a parking permit is required. This can be obtained via Security. You will need proof of insurance and ID before a permit will be issued.

## 1.3 How to find us: the staff

A listing of academic, administrative, research and technical staff by area of responsibility and their contact details can be found in Appendix 5. A listing of all teaching staff and their contact details is given in Appendix 6.

## 1.4 How to find us: the Departmental office

The Departmental Office can be found in T116, Tolansky Building.

The principal departmental telephone number is: 01784 443506.

The generic departmental email address is: [Physics@rhul.ac.uk](mailto:Physics@rhul.ac.uk).

The Euromasters Administrator can be found in W155, Tel: 01784 276464.

## 1.5 The Department: practical information

The following notes provide information of a general nature about security and safety within the Department.

**Normal Hours.** The Department is normally open Monday to Friday 08.30 to 17.00 and closed at weekends and public holidays. Outside normal hours all external doors are locked. Undergraduates are allowed in the Department outside normal hours only under supervision.

**Fire Procedure.** Fire Regulations are posted in the Department. Staff and students should familiarise themselves with these and with the fire alarm system, the evacuation procedure and assembly point 12 on the corner near the Physics Workshops. Fire Wardens are appointed for each floor and building. In the event of a bomb scare, evacuation procedures are as for a fire drill.

**First Aid.** First Aid Boxes are provided in the Department. Staff and students should be aware of their location. Qualified First Aiders are listed near these boxes and in Appendix 1. Outside normal hours dial 444 from any phone in the Department and ask for assistance.

**Smoking.** The Department follows the College No Smoking Policy. Smoking is not allowed anywhere in the Department or within 5 metres of the building.

**Eating and Drinking.** The Department has a kitchen in T132 for the preparation of drinks. Food (small meals and snacks) and drinks may be prepared and consumed in T132/T118. Food and drinks are not allowed anywhere else in the building, especially in laboratories or workshops.

**Safety.** It is important that you are safe in the laboratory at all times. You must become familiar with safety procedures and safe working practices must be followed at all times. In particular you are not allowed into research laboratories unless supervised by a member of staff. Everyone, including you, has a legal duty to ensure the safety of yourself and others. The Head of Department has appointed a Safety Officer, a Deputy Safety Officer and a Radiation Supervisor to advise and assist him in safety matters. Risk Assessments will have been carried out for all work in teaching laboratories, research laboratories and workshops.

**Ionising Radiation.** Work with ionising radiation is only permitted when approved by the Departmental Radiation Protection Supervisor and the College Safety Officer. All work must conform to the RHUL Site Rules and the Physics Department Local Rules for Work with Ionising Radiation.

**Accident Reports.** All accidents involving injury must be reported to the College Safety Officer by the senior person on site within 24 hours of any occurrence via an Accident Report Form. First Aiders and the Departmental Safety Officer have these forms and will usually be required to complete them.

**Out of Hours Working.** Experimental work is not permitted outside normal hours if it involves working alone.

**Dangerous Incidents.** Events that give rise to a situation involving the possibility of an accident, even though no harm in fact occurs, must be reported to the Safety Officer.

**Laser Pointers.** Students must not use or keep their own laser equipment on College premises. If a student requires a laser pointer for use during a presentation, the Department can supply one.

## 2 Communication

It is vitally important that you keep in touch with us and we keep in touch with you. Members of staff will often need to be able to contact you to inform you about changes to teaching arrangements, special preparations you may have to do for a class or meetings you might be required to attend. You will need to be able to contact members of the Department for example, if you are unable to attend a class, or wish to arrange a meeting with your Personal Adviser.

Email to your College email address is routinely used and **you should check regularly** (at least daily) if any official communication has been sent to your email address. **Do not** ignore the email as it will be assumed that it will have been received by you within 48 hours, excluding Saturdays and Sundays.

You should also make a habit of checking the student pigeonholes in the Department.

### 2.1 Email

The College provides an email address for all students free of charge and stores the address in a College email directory (the Global Address List). Your account is easily accessed, both on and off campus, via the **student portal** <https://campus-connect.rhul.ac.uk/cp/home/displaylogin> (Campus Connect) or direct via **Outlook.com** <http://outlook.com/>. **Email to this address will be used routinely for all communication with students.** Email may be used for urgent communication and by course tutors to give or confirm instructions or information related to teaching so it is important that you build into your routine that you **check your emails once a day**. Email communications from staff and all the Faculty Administrators should be treated as important and read carefully.

The College provides a number of PC Labs around Campus for student use, and you can also use your own laptop/smart phone etc, so the Department expects you to check your email regularly. It is also important that you regularly clear your College account of unwanted messages or your in-box may become full and unable to accept messages. **Just deleting messages is not sufficient; you must clear the 'Sent Items' and 'Deleted Items' folders regularly. It is your responsibility to make sure your College email account is kept in working order.** If you have any problems contact the **IT Service Desk** <http://itservicedesk.rhul.ac.uk/>.

The Physics Department will only use the address in the College Global Address List and **does not** use private or commercial email addresses, such as hotmail or Gmail. Students who prefer to use commercial email services are responsible for making sure that their College email is diverted to the appropriate commercial address. Detailed instructions on how to forward mail can be accessed by visiting <http://help.outlook.com/> and searching for **forwarding**. This process is very easy, but you do have to maintain your College account. When you delete a forwarded message from, say, hotmail, it will not be deleted from the RHUL account. **It is your responsibility to log on to your College account occasionally and conduct some account maintenance or your account may become full and therefore will not forward messages.**

If you send an email to a member of staff in the Department during term time you should normally receive a reply within 3-4 working days of its receipt. Please remember that there are times when members of staff are away from College at conferences or undertaking research.

## 2.2 Post

All post addressed to students in the Physics Department is delivered to the student pigeonholes in the post room, T128. At the end of each term student pigeonholes are cleared of accumulated mail which is then destroyed. Important information from Registry is often sent by internal post and tutors sometimes return work to you via the pigeonholes so you are advised to check them regularly.

## 2.3 Telephone and postal address

It is **your responsibility** to ensure that your telephone number (mobile and landline) and postal address (term-time and forwarding) are kept up to date on the **student portal** (Campus Connect) <https://campus-connect.rhul.ac.uk/cp/home/displaylogin>. There are occasions when the Department needs to contact you urgently by telephone or send you a letter by post.

The Department does not disclose students' addresses and telephone numbers to anybody else (including relatives and fellow students) without the student's specific permission to do so.

## 2.4 Notice boards

The official student notice boards are on the walls outside the Tolansky Teaching Laboratory, T231. Every effort is made to post notices relating to class times etc well in advance, but occasionally changes have to be made at short notice and in that case email will be used.

**It is your responsibility to check the times and venues of all class meetings and of any requirements (eg. essay deadlines) relating to your courses**, so, if in doubt, please ask!



## 3 Teaching

### 3.1 Dates of terms

**Term dates** can be found on the College website  
<http://www.rhul.ac.uk/aboutus/collegecalendar/home.aspx>.

The term dates for intercollegiate lectures are as follows:

Autumn Term: Monday 30 September – Friday 13 December 2013  
Spring Term: Monday 13 January – Friday 28 March 2014

### 3.2 Attendance requirements

The Department monitors your attendance, academic engagement and progress in order to offer you appropriate academic and pastoral support and to identify where support from outside the Department may be necessary. Inadequate engagement on a course may lead to disciplinary action which can result in the termination of your registration (see section on **Disciplinary action**) or on courses where the attendance requirements are stated in the course specification, the outcome of Attendance Fail (AF) (see the section on **Outcomes** of course assessment for further explanation of the AF outcome).

Students **must**

- attend all classes necessary for the pursuit of their studies,
- undertake all assessments and
- attend meetings and other activities as required by the Department.

A class is any learning and teaching activity and the term is used to encompass such things as lectures, seminars, tutorials, workshop, field work, laboratories, advisor meetings etc. This means not simply turning up – but arriving having undertaken whatever reading, thinking, or research was identified as necessary preparation. You are also expected to arrive punctually - teaching activities are timetabled to start at 5 minutes past the hour and finish 5 minutes before the hour. You may be marked absent if you turn up late without good reason.

The Department of Physics takes the matter of course attendance and the submission of coursework very seriously. **It is your responsibility** to complete any attendance register that is circulated and to make sure that your attendance has been noted. If you are absent from teaching sessions twice in a row without good reason the Department will automatically contact you to ensure that you are safe and well and to request an explanation. Failure to respond, or further absence, is a serious matter.

It is important that you attend all the learning activities related to your programme of study. Whilst attendance is compulsory at all learning activities it is recognised that emergencies may occur at any time throughout the year and therefore a minimum 75% attendance level has been set. You should also be aware that there may be some courses which you study which have a specific course attendance requirement. If you face difficulty in attending any classes or undertaking an assessment it is your responsibility to inform the Department(s) in which you are

studying and provide a satisfactory explanation. As long as you are meticulous in your honesty in reporting and explaining these exceptions, we aim to be understanding in our response.

You must manage your time so that any paid employment, voluntary or other activities fit into the times when you are not required to be in a class. You are reminded that **Postgraduate Taught Regulations** (<http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>) stipulate that the amount of paid work undertaken by a student enrolled with the College on a full-time basis shall not exceed 20 hours per week during term time. No student may undertake paid work which may conflict with his/her responsibilities as a student of the College.

If you are having other problems that are causing you to miss classes, you should talk to your Personal Adviser, year tutor or another member of staff, or visit the Student Advisory Service or **Students' Union** before your problems get out of control. There are many people who can provide **Support** on <http://www.rhul.ac.uk/ecampus/welfare/home.aspx> but remember - they cannot help if you do not ask.

In recognition of its legal responsibilities under the Equality Act 2010, the College may adjust the attendance requirement. It will only do this when such adjustment does not compromise competence standards or the ability of the student to reach the learning outcomes of the course. Any need to adjust attendance requirements will be treated on a case-by-case basis and discussed by the Department with the Educational Support Office and Academic Development.

### 3.3 Notification of absence

**This guidance applies if you are absent from classes for any reason.**

You must

- a. advise the Departmental Office in advance if you expect to be absent for good cause, such as a hospital appointment.
- b. complete the Notification of Absence Form available from eCampus <http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx>. Copies of the Notification of Absence Form – Self certification are also available from the Health Centre.
- c. submit the paperwork to the Departmental Office either before your absence or within FIVE working days of the end of the period of absence. Failure to do so may result in the absence being counted as unacceptable and counting against the minimum attendance level.
- d. ensure that you meet any departmental requirements concerning notification of absence or request for leave of absence as you may be required to meet formally with an academic tutor. You are also responsible for taking all necessary steps to catch up with the missed work.

This table shows the documentation that is required should you be absent for any reason.

Reason for absence	Documentation required
Illness up to and including 5 consecutive term-time days (excluding Saturdays and Sundays)	Completed Notification of Absence Form – Self Certification
Illness for more than 5 consecutive term-time days (excluding Saturdays and Sundays)	Completed Notification of Absence Form - Self Certification plus Formal Medical Certification signed by the Health Centre, your GP or hospital consultant
Unrelated to sickness	Notification of Absence Form plus supporting evidence (see <a href="http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx">http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx</a> for details of required evidence)
Leave of absence request	Notification of Absence Form plus any departmental requirement must be met

Note:

- If you should be absent for a prolonged period it is important that you keep in touch with your department.
- Departments will monitor the frequency of self-certified absences and a Head of Department may request that you provide a doctor's medical certificate in multiple and sustained instances of self-certified illness.
- It is at the discretion of the Department as to whether any absence is deemed acceptable or unacceptable (see <http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx> for details of what constitutes 'acceptable' and 'unacceptable' circumstances relating to absence). If deemed unacceptable the absence will be recorded as such and will count against the minimum attendance level.

**If you are absent from an examination or assessment then you must follow the guidance in the [Essential Examinations Information](#)**

<http://www.rhul.ac.uk/ecampus/academicsupport/examinations/examinations/home.aspx> (see also the section on **Assessment information**).

For further details on the kinds of circumstances where absence may be deemed as 'acceptable' and 'unacceptable' and for the type of supporting evidence that you may be required to provide as justification of absence, please click on 'Studying' tab on the Student Home page

<http://www.rhul.ac.uk/ecampus/academicsupport/attendance/home.aspx>.

### 3.4 Meetings

You are likely to be 'invited' to meet with a member of academic staff in your department:

- if you fail to attend all learning activities in two consecutive weeks without providing an explanation

- where your pattern of absences is:
  - considered to be having an effect your work or causing concern for your well being
  - pointing to a possible disability that you may not have disclosed
  - where your attendance is approaching the minimum attendance level

You should take any meeting 'invitation' seriously. If you should have problems you are being offered an opportunity to seek advice and assistance. At the meeting the Department's expectation of you will be made clear and the formal disciplinary process will be outlined to you.

### 3.5 Disciplinary action

Should you choose not to pay attention to your studies then formal disciplinary action may be implemented. You could be issued with a formal warning which can escalate to the termination of your registration at the College <http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>. On courses where there is a specified attendance level requirement the Departmental Sub-Board of Examiners may judge that you have not fulfilled the learning outcomes of a course and award the outcome of Attendance Fail (AF) for the course. Students who receive the outcome of AF for a course have not passed the course; they are not permitted to re-sit the assessment for the course and must repeat the course in attendance in order to complete it. Thus the outcome of AF can prevent you from graduating.

In situations where documented severe difficulties are experienced by a student the College will make every effort to support the student and counsel them as to the best course of action. However, there may be cases where, although non-attendance is explained by an acceptable reason the student's level of attendance falls to a level which compromises educational standards or the ability of the student to reach the learning outcomes of the course. In such cases it will be necessary to implement disciplinary procedures as detailed above.

### 3.6 Withdrawal of visa

If you are in receipt of a **Tier-4 Student Visa** sponsored by Royal Holloway, it is a requirement of your Visa that you attend classes and complete assessments. This is also a requirement of the College's academic regulations. The College has a legal responsibility **to report any student admitted to the College on a student visa who does not appear to be in attendance to the UK Border Agency (UKBA)**. Therefore if you fail to meet UKBA visa requirements and/or fail to respond to informal and formal warnings from the College in this regard you could have your sponsorship withdrawn, your Visa cancelled and your registration with the College terminated. The termination of registration due to a breach in Visa requirements is conducted independently of the College's formal warning process and the decision is not open to appeal.

Please see the College [Postgraduate Taught Regulations](http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx) (<http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>)

## 4 Degree Structure

Full details about your programme of study, including, amongst others, the aims, learning outcomes to be achieved on completion, courses which make up the programme and any programme-specific regulations are set out in the programme specification available through <http://www.rhul.ac.uk/coursecatalogue/home.aspx> or <http://www.rhul.ac.uk/studyhere/progspeccs/home.aspx>.

The programme consists of a taught first year, which incorporates a significant research project and research skills training element. This is followed by a research year at RHUL, with a choice of research training courses. Alternatively the possibility exists to transfer to a SEPnet partner at the end of year 1.

Year 1 Taught year	Lecture courses - (Advanced) Quantum Theory - Choice of five other courses Project (including key skills training)	7.5 ECTS 37.5 ECTS 15 ECTS
Year 2 Research year	Research Project (including research training courses)	60 ECTS

The Project in year 1 is in a research area of a member of academic staff in the Department. The lecture courses are selected from the current list given in Appendix 1 in consultation with the Programme Director.

The Research Project in year 2 is also supervised by a member of academic staff in the Department. Research training courses are listed below.

The Programme Director is Prof. Jon Goff who also acts as the Director of Graduate Studies in the Department of Physics. The Programme Director will help you with any difficulties you may have and he may advise you on deferral or interruption of your studies.

The programme lasts for two years, with each year comprising 60 ECTS, individual lecture courses are 7.5 ECTS.

### The First Year

In your first year you will take six taught courses, including usually PH5211 Statistical Mechanics and PH5226 Advanced Quantum Theory. Students, who can demonstrate that they have already achieved a high grade in Statistical Mechanics and in Quantum Theory, may be allowed to choose two other courses instead.

The first year courses are taught by members of the University of London intercollegiate MSci consortium. The current course list is given in Appendix 1; in any year this can change with courses withdrawn and new ones introduced. The definitive list, with course details, is given in the Intercollegiate MSci Handbook. The undergraduate MSci course codes are in the format PH4xxx. MSci courses taken by postgraduate students have a course code in the format PH5xxx (eg PH4211 Statistical Mechanics as listed in the MSci Handbook becomes PH5211 when taken as part of the Euromasters programme). The course choice should be made before the beginning of the programme with advice from the Programme Director.

There is a written examination associated with each lecture course, taken in the summer term. The timetable for the examinations is published towards the end of the spring term.

### **The Second Year**

In the second year you will conduct a Research Project PH5500 (60 ECTS). Associated with this, you may take a series of specialist research training courses.

### **Research Training**

In your second year, as part of your Research Project, you may participate in research training on topics related to the project, through directed study, seminars and lectures. Typically, you will take four courses from the current list on offer. This includes:

- Nanophysics
- Nanofabrication techniques
- Low Temperature techniques
- Vacuum techniques
- Neutron scattering
- Nuclear magnetic resonance
- Theory of strongly correlated systems
- Optical techniques for accelerator science
- RF techniques for accelerator science
- Analysis methods in particle physics
- Techniques in Particle Physics Phenomenology
- UNIX and Root
- Detectors for particle physics
- Trigger and data acquisition in particle physics
- Neutrino physics
- Introduction to machine physics
- Double beta decay primer

There will be no formal examinations in these courses. Progress will be assessed by coursework and seminar participation. A simple pass in each module is required.

### **4.1 Course registrations**

While you have the option of changing course unit registrations within the first two/ three weeks in an academic term subject to agreement from the department, once you have submitted assessment for the course, you may not replace it with another either in that term or in a subsequent term (e.g. Spring term). Any courses that you wish to take on an extracurricular basis (that is, as extra and not counting towards your degree) must be identified at the start of the academic year or before any assessment has been completed for the course.

## 5 Facilities

### 5.1 Libraries

There are 2 libraries on campus:

- **Founder's Library**, located on the South Side of Founder's Building, houses most language, literature, film, music and theatre material;
- **Bedford Library**, located up the hill from the Students' Union next to the History Department, houses science, social science and history material;

Details, including further resources available, opening times and regulations, can be found online: <http://www.rhul.ac.uk/library/home.aspx>

If you cannot find the specific items that you require in the libraries, it is possible to order items from other libraries by inter-library loan or to gain access to the Senate House Library or other university libraries. You can obtain further information on this by asking at the library helpdesks. The Information Consultant for Physics is Nancy Pontika, who can be contacted at [nancy.pontika@rhul.ac.uk](mailto:nancy.pontika@rhul.ac.uk).

The Library provides a range of training sessions designed to enhance your existing library and research skills. These are available in both class-based and self-study formats. For information on available sessions and to book a place, go to: <http://www.rhul.ac.uk/library/helpandsupport/findinginformation.aspx>.

### 5.2 Physics Resources Room (T118)

In addition to the books available in the Bedford Library, the Department provides some books for physics students in the Physics Resources Room in T118. This is not a formal library so the stock held there is limited. It is not meant to be a replacement for the Bedford library but merely an additional option for your studies. **You must not remove any text books from T118.** The Resources Room (T118) is available to all members of the Department. A range of learning materials including a selection of the recommended textbooks, and study seating is provided. Various periodicals including *New Scientist* and *Scientific American* are also made available to read. A small number of PCs are available for general use. The Resources Room must be kept clean and tidy. Occasionally the room is made unavailable to students during departmental meetings and other functions.

There are facilities for making hot drinks in T132 and these may be consumed in the Resources Room. This area is available for students to use on condition that it is kept clean and tidy. There is a soft drinks dispenser on the ground floor foyer of Wilson and a chilled water dispenser in T118.

### 5.3 Photocopying, printing and computing

#### 5.3.1 Photocopying

The departmental photocopier is in constant use by office staff and lecturers. For this reason, we are unable to allow students to use it. Instead you can use copier-printers (MFDs) located in the libraries, the Computer Centre and many PC labs,



which will allow you to make copies in either black and white or colour. Further information is available online:

<http://www.rhul.ac.uk/library/usingourlibraries/photocopyingandprinting.aspx>.

### **5.3.2 Printing**

Many of the PC labs are open 24 hours a day, 7 days a week. Alternatively, there are computers available for your use in the libraries and Computer Centre.

Departmental staff are unable, in any circumstances, to print anything out on your behalf. Copier-printers (MFDs) are located across the campus in the PC labs, libraries and Computer Centre. Further information on printing is available online: <http://www.rhul.ac.uk/it/printing/home.aspx>.

### **5.3.3 Computing**

The Computer Centre provides a range of IT training sessions designed to enhance your current IT skills. These are available in both class-based and self-study formats, and successful completion of the course is rewarded by a College IT Skills certificate. To participate in these sessions, go to: <http://www.rhul.ac.uk/it/training/home.aspx>.

A suite of PCs is also located in the teaching laboratory. These computers are used for many courses. When not timetabled for use in teaching, they are available for general use but may not be used for playing games etc.

## **5.4 Lockers**

Lockers are provided for your use on the second floor of the Tolansky Building opposite the lift. These lockers are intended for daily use and not for overnight storage. To use a locker, open one with a key in the door, insert £1 in the slot inside the door, close the door and remove the key. The £1 is returned when the key is returned to the locker. For the sake of subsequent users, please ensure that lockers are left clean and dry.

No guarantee of security or insurance is provided and the Department retains the right to open any locker and remove and dispose of the contents.

Contact the technicians in the Teaching Laboratory if you lose a locker key or if the Department has removed the contents. Proof of ownership of the contents will be required in either case and it is, therefore, strongly recommended that your name or other means of identification be stored with the contents.

## **5.5 Telescopes**

The four-metre dome on top of the Wilson Building houses the Department's telescope – a 12inch Schmidt-Cassegrain computerised  $f/10$  telescope. Depending on weather conditions, regular sessions are organised by the Physics Society to observe objects such as planets, multiple star systems, galaxies, galactic clusters, and globular clusters. Students wishing to use the telescope should, in the first instance, consult the Astrophysics Course Director.



## 5.6 Mathematica

Extensive use is made of the *Mathematica* software system in several of our courses. *Mathematica* is available on the College PC network, including the PCs in Tolansky, for you to use for your studies and coursework. As a Royal Holloway student it is possible for you to install a copy of *Mathematica* on your own computer for a nominal cost.

## 6 Seminars, Coursework and Projects

### 6.1 Seminars, colloquia and guest lectures

The Department holds a regular series of colloquia and seminars on important research topics, as well as ad hoc seminars given by short stay visitors. Students are encouraged to attend these.

Throughout the programme a number of guest lecturers will be arranged. These will include lectures from external organisations, such as Oxford Instruments plc, the National Physical Laboratory, the Rutherford-Appleton Laboratory and CERN. Students will be expected to attend these.

### 6.2 Coursework

Most courses will have an element of coursework, which will contribute to the assessment. All coursework should be submitted by the specified deadline. Examinations for the taught courses are held in the summer term. For each course there is an associated examination paper. These papers test knowledge and understanding of each course and the ability to apply the material, e.g. by carrying out related calculations.

### 6.3 The 1<sup>st</sup> year Project

This project, PH5100, will occupy some 25% of your first year. The project is in a research area of a member of academic staff in the Department, who will supervise the work, define what is expected, advise on background literature and what skills are to be developed. This project should prepare you for the more extensive research project in your second year. A two-page progress report must be submitted to the Programme Director by the end of January. The purpose of this short report is to ensure that the scope of the project is well defined and that substantial progress has already been made. The experimental, theoretical or computational work should be completed in good time to ensure that the report can be submitted by the deadline of the end of the spring term.

#### **Word count**

The length of the report should be between 7,000 and 10,000 words. All over-length work submitted will be penalised.

#### **Marking criteria**

The project is marked by the project supervisor and second-marked in the Department. A significant fraction of the supervisor's assessment is based on how well the project was tackled, difficulties overcome, etc. The second marker

concentrates on the quality of the project as made evident in the report. The two examiners agree a mark that is sent to the Visiting Examiner together with a copy of the report for comment.

Students make an oral presentation and a poster presentation of their work, which contributes 20% to the overall mark. This provides an opportunity to demonstrate communication and other skills.

Students need to achieve at least a pass mark (50%) in their project in order to proceed to the second year. The following assessment criteria apply:

Mark	Typical characteristics (as appropriate)
80 - 100%	<b>Outstanding work.</b> Outstanding execution and report, showing good planning, good initiative, clarity of work, insight and pertinent comments.
70 - 79%	<b>Excellent work.</b> Excellent clear record, results and their presentation, appropriate analysis and a summary with reasoned conclusions.
60 - 69%	<b>Good work.</b> Project and record mostly complete, good results and presentation, analysis with some error estimates (if appropriate), limited conclusions.
50 - 59%	<b>Competent work.</b> Good progress achieved, some record, results partly analyzed, perhaps with limited critical evaluation, limited summary.
40 - 49%	<b>Modest work.</b> Limited progress, incomplete report, some analysis, perhaps no evaluation or summary.
30 - 39%	<b>Poor work.</b> Work only partly done, very poor record, with little analysis, few graphs, no error estimates or summary.
0 - 29%	<b>Very poor work.</b> Very little submitted. Missing some or all of work record, results, analysis or summary.

## 6.4 The 2<sup>nd</sup> year Research Project

In the second year you will conduct a Research Project PH5500 (60 ECTS). Associated with this, you may take a series of specialist research training courses. These will be delivered through a combination of lectures, directed study and seminars.

### Choice of Research Project topic

Topics available for Research Projects are presented to students during the first year in the form of a title, brief abstract, any prerequisite skills or knowledge required and the name of the project supervisor. It is important to discuss potential projects with the supervisors offering them before making a final choice. The range of projects available is wide, reflecting the diverse interests of the academic staff. Details of the research areas and the staff involved are to be found on the Department's web pages. In addition, some projects will be developed in consultation with Rutherford Appleton Laboratory and the Harwell Science and Innovation Campus (including ISIS neutron spallation source and DIAMOND synchrotron x-ray scattering facility), Oxford Instruments plc (a major employer in the field), the National Physical Laboratory, CERN and other institutions. Thus the spectrum of projects ranges from fundamental science to problems of industrial relevance; the choice reflects the

interests of the student. Projects can be:

- Experimental, for example development of a new technique or instrument, measurements on new problems using established techniques;
- Analysis of data from ongoing experiments;
- Computational, for example use of Monte Carlo methods in simulating physical systems;
- Theoretical, either fundamental theory, modelling of a particular experiment, or modelling of the performance of a scientific instrument.

### **The Research Project supervisor**

The project supervisor directs the project, defines what is expected, advises on background literature and what skills are to be developed. A two-page progress report must be submitted to the Programme Director by the end of January and students will give brief presentations on their work. The purpose of this short report is to ensure that the scope of the project is well defined and that substantial progress has already been made. The experimental, theoretical and computational work should be completed in good time to ensure that the thesis can be submitted by the deadline in the summer term.

### **Content of Research Project**

The thesis must contain an abstract, an introduction setting the work in context, a survey of the relevant literature, and a report of the work carried out. Advice on writing a scientific report is contained in the Handbook of Skills Training for Physics Students. The project supervisor gives further advice and reads and comments on the first draft.

### **Presentation**

The thesis must be written using a word processor and be well presented. It should be bound in a simple binding such as can be done in the Department (a hard cover is not necessary). The title of the project and the student's name must be clearly visible on the front cover.

### **Word count**

The length of the thesis should be between 15,000 and 20,000 words (excluding figures). All over-length work submitted will be penalised.

### **Marking criteria**

In assessing the project thesis the examiners are looking for a clear description of the work carried out, a good knowledge and understanding of the work done, a clear set of results and conclusion, a well-argued document, and good standards of English and presentation. The achievements should be commensurate with what a reasonable student can achieve in the time allocated.

The research project is marked by an External Assessor, the project supervisor and second-marked in the Department. The agreed mark is sent to the Visiting Examiner together with a copy of the project report for comment.

Students need to achieve at least a pass mark (50%) in their research project in order to be awarded the degree. The following assessment criteria apply:

Mark	Typical characteristics (as appropriate)
80 - 100%	<b>Outstanding work.</b> Outstanding execution and report, showing good planning, good initiative, clarity of work, insight and pertinent comments.
70 - 79%	<b>Excellent work.</b> Excellent clear record, results and their presentation, appropriate analysis and a summary with reasoned conclusions.
60 - 69%	<b>Good work.</b> Project and record mostly complete, good results and presentation, analysis with some error estimates (if appropriate), limited conclusions.
50 - 59%	<b>Competent work.</b> Good progress achieved, some record, results partly analyzed, perhaps with limited critical evaluation, limited summary.
40 - 49%	<b>Modest work.</b> Limited progress, incomplete report, some analysis, perhaps no evaluation or summary.
30 - 39%	<b>Poor work.</b> Work only partly done, very poor record, with little analysis, few graphs, no error estimates or summary.
0 - 29%	<b>Very poor work.</b> Very little submitted. Missing some or all of work record, results, analysis or summary.

There is an oral examination following submission of the project at which the Visiting Examiner and at least one other examiner is present. This examination may probe any aspect of understanding of the material in the programme but frequently places special emphasis on the project. A good performance in this examination may be used to raise the award of a borderline candidate.

## 7 Assessment Information

### 7.1 Illness or other extenuating circumstances

If you are taken ill or there are other extenuating circumstances that you believe have adversely affected your performance in relation to any aspect of your course/programme (for example, your attendance, submission of work, or examination performance) at any point during the academic year, you must inform your department in writing, and provide the appropriate evidence. Please read the “**Instructions to Candidates**” issued by the Examinations Office <http://www.rhul.ac.uk/ecampus/academicsupport/examinations/examinations/home.aspx> for full details on how and when to inform your department about such circumstances as well as the deadline for submission of such information.

#### **Absence from an examination / failure to submit coursework**

Please see the section on **progression and award requirements** for further details of the impact on course outcomes of failure to attend an examination or to submit required coursework.

If you miss an examination or fail to submit a piece of assessed coursework through illness, or other acceptable cause for which adequate documentation is provided in accordance with the section on illness or other extenuating circumstances in the **Instructions to Candidates**, the Sub-board of Examiners may take this into account when considering your results.

## **Exam access arrangements for disabled students and those in need of support**

For all such students there is a process to apply for access arrangements for your examinations and other forms of assessment. Such requests should be made to the Educational Support Office (ESO) which will carry out an assessment of your needs. Please see the section **Students in need of support** (*including disabled students*) for further guidance about registering with the ESO.

### **7.2 Submission of written work**

Coursework is usually submitted in 'hard copy' form by placing it in the appropriate 'post-box' in the departmental post room. Some course leaders may accept or require coursework to be submitted electronically. All coursework should be submitted by the specified deadline. Please ensure that you are aware of the deadlines set by the course leader.

### **7.3 Extensions to deadlines**

Sympathetic treatment will be given for documented illness or other good cause. Where possible, new deadlines should be agreed with the member of staff concerned **before** the stated deadline. Students that miss deadlines through illness should see the staff member concerned on their return and complete a Notification of Absence form (available on Moodle or eCampus <http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx>).

Note that the loss of coursework prior to submission due to any type of computer failure (e.g. file corruption) is not an acceptable reason for late submission or non-submission of work. It is your responsibility to follow well-known IT precautionary procedures. Specifically, frequently back up your work to a location remote from your PC. You are also strongly advised not to leave irreplaceable work (lecture notes, coursework, project reports) in an unattended car, where they or the car may be stolen.

### **7.4 Penalties for late submission of work**

The following College policy applies to all students (new, continuing and resitting or repeating) on taught programmes of study with effect from September 2012. Please ensure that you are aware of the deadlines set by your department and also the requirements to meet this deadline, e.g. whether you need to submit electronic and/or paper copies for your submission to be deemed complete (see 7.2 above).

In the absence of acceptable extenuating cause, late submission of work will be penalised as follows:

- for work submitted up to 24 hours late, the mark will be reduced by ten percentage marks;\*
- for work submitted more than 24 hours late, the mark will be zero.

\*eg. an awarded mark of 65% would be reduced to 55% and a mark of 42% would be reduced to 32%.

If you have had extenuating circumstances which have affected your ability to submit work by the deadline these should be submitted in writing, accompanied by any relevant documentary evidence, to your department. As with all extenuating circumstances it is the discretion of the examiners whether to accept these as a reason for having not submitted work on time. Please see the section on applying for an **extension to the deadlines** set, and the section for details on **submitting requests for extenuating circumstances** to be considered.

## 7.5 Anonymous marking and cover sheets

Anonymous marking is used for examinations and for some pieces of work throughout the year. Each student is issued with a candidate number for this purpose. This number is independent of your student number and should not be confused with it.

## 7.6 Penalties for over-length work

The following College policy applies to all students on taught programmes of study:

All over-length work submitted on undergraduate and taught postgraduate programmes will be penalised as follows:

For work which exceeds the upper word limit by at least 10% and by less than 20%, the mark will be reduced by ten percentage marks\*, subject to a minimum mark of a minimum pass.

For work which exceeds the upper word limit by 20% or more, the maximum mark will be zero.

\*eg. an awarded mark of 65% would be reduced to 55%.

In addition to the text, the word count should include quotations and footnotes. Please note that the following are excluded from the word count: candidate number, title, course title, preliminary pages, figures, bibliography and appendices.

## 7.7 Return of written coursework

The following College policy applies to the return of coursework:

Assessed work (other than formal examinations) should be returned within 4 weeks of the submission deadline, except in cases where it is not appropriate to do so for academic reasons. The deadline for the return of marked work should be made clear to students when they receive their assignments. In the event that the intended deadline cannot be met, the revised deadline must be communicated to students as soon as possible.

## 7.8 Assessment offences

The College has regulations governing **assessment offences** which can found on the following webpage:

<http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>

Assessment offences include, but are not limited to plagiarism (see below), duplication of work, that is, submitting work for assessment which has already been submitted for assessment in the same or another course, falsification, collusion, for example, group working would constitute collusion where the discipline or the method of assessment emphasises independent study and collective ideas are presented as uniquely those of the individual submitting the work, failure to comply with the rules governing assessment (including those set out in the 'Instructions to candidates'. The Regulations set out some of the types of assessment offences in more detail, the procedures for investigation into allegations of such offences and the penalties. Students are strongly encouraged to read these Regulations and to speak with their Personal Advisors or other members of staff in their department should they have any queries about what constitutes an assessment offence. The College treats assessment offences very seriously and misunderstanding about what constitutes an assessment offence will not be accepted as an excuse. Similarly extenuating circumstances cannot excuse an assessment offence. Students with extenuating circumstances which affect their ability to submit work should contact their departments about the possibility of an extension or other support.

## 7.9 Plagiarism

### Definition of plagiarism

'Plagiarism' means the presentation of another person's work in any quantity without adequately identifying it and citing its source in a way which is consistent with good scholarly practice in the discipline and commensurate with the level of professional conduct expected from the student. The source which is plagiarised may take any form (including words, graphs and images, musical texts, data, source code, ideas or judgements) and may exist in any published or unpublished medium, including the internet.

Plagiarism may occur in any piece of work presented by a student, including examination scripts, although standards for citation of sources may vary dependent on the method of assessment. Identifying plagiarism is a matter of expert academic judgement, based on a comparison across the student's work and on knowledge of sources, practices and expectations for professional conduct in the discipline. Therefore it is possible to determine that an offence has occurred from an assessment of the student's work alone, without reference to further evidence.

### 7.10 Marking of illegible scripts

It is College policy not to mark scripts which are illegible. If you anticipate that you may have difficulty in handwriting scripts which would lead to your scripts being illegible you should contact the **Educational Support Office**.  
<http://www.rhul.ac.uk/ecampus/welfare/disabledstudents/home.aspx>.

### 7.11 Progression and award requirements

The Regulations governing progression and award requirements are set out in your Programme Specification (<http://www.rhul.ac.uk/coursecatalogue/home.aspx>) and also more generally in the **Postgraduate Taught Regulations**  
<http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>

If you do not pass a course unit at a first attempt you may be given an opportunity to 're-sit' or 'repeat' the course unit.

**Re-sit of a failed course unit** – normally gives students an opportunity during the following academic year to re-sit any failed parts of a course unit not passed. Students do not have to attend any classes. Marks for work which has been passed will be carried forward. Students are required to register to resit course units. Unless students have been informed otherwise, the mark for such courses will be capped at 50%.

**Repeat of a failed course unit** – if you are given the opportunity to repeat a course unit in attendance you will need to register for the course unit for the following academic year and satisfy afresh all the assessment and attendance requirements, that is, you are expected to attend all classes and redo all required coursework and examinations for the course unit. No marks from the previous attempt at the course unit are carried forward and no work from completed as part of the first attempt at the course may be resubmitted for assessment. The mark for a course repeated in attendance is not capped.

Please note that it is **not** possible to re-sit or repeat a course unit which you have passed.

**NB:** Students entered to resit an examination will normally not receive an overall percentage mark greater than 50% for that course unit.

### **Outcomes of course unit assessment**

The Postgraduate Taught Regulations require that for a student to qualify for final consideration in a course unit by the Sub-board of Examiners, a candidate must first:

- (a) have satisfied the attendance requirements specified for the course;
- (b) have completed and presented for assessment all work specified for the course within specified deadlines.

The Sub-board of Examiners will determine an outcome and a percentage mark recorded as an integer between 0% and 100% inclusive for each candidate who qualifies for final consideration, as follows:

- (a) an outcome of Pass (P) with a percentage mark will be returned where the candidate has achieved a mark of 50% or above overall and in all elements of the assessment which carry an individual pass requirement;
- (b) an outcome of Fail (F) with a percentage mark will be returned where the candidate has achieved a mark of 49% or below overall, or in any element of the assessment which carries an individual pass requirement;
- (c) an outcome of Attendance Fail (AF) without a percentage mark will be returned where the candidate has not met the attendance requirements stated in the course specification. For the purposes of calculating the final average, an AF will be treated as a zero unless a subsequent percentage mark is achieved through repeating the course in attendance.



For details on the requirements governing the level of award please see the section on the **Consideration and Classification of Candidates for the Award** in the Postgraduate Taught Regulations  
<http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx>.

## 7.12 Examination/assessment results

Please see the **Examinations** website  
<http://www.rhul.ac.uk/ecampus/academicsupport/examinations/home.aspx> for details of how you will be issued with your **results**.  
<http://www.rhul.ac.uk/ecampus/academicsupport/examinations/results.aspx>

The Examinations website is the place where you can access the "**Instructions to Candidates**" and details of the examinations **appeals** procedures  
<http://www.rhul.ac.uk/ecampus/academicsupport/academicappealsandcollegecomplaints.aspx>.

## 8 Student Support

### 8.1 Students in need of support (including students with special needs)

Your first point of reference for advice within the Department is the Programme Director or Faculty Administrator (PGT). Inevitably, problems will sometimes arise that neither are qualified to deal with. The College offers a high level of student welfare support which includes a comprehensive Health Centre, a highly regarded Counselling Service, dedicated educational and disability support, as well as a wealth of financial, career and other advice. Further details of each service can be found on the College web on the **Student Welfare** page  
<http://www.rhul.ac.uk/ecampus/welfare/home.aspx>.

If you have a disability or specific learning difficulty, it is important that you bring it to our attention as soon as possible. The Departmental Educational Support Office (ESO) representative is the Senior Tutor or the Faculty Administrator (Undergraduates). You must also contact the ESO (Founders West 151; tel: +44 (0)1784 443966; email: [educational-support@rhul.ac.uk](mailto:educational-support@rhul.ac.uk)) who will arrange for an assessment of needs to be carried out and will advise on appropriate sources of help. Further information is available on the College web on the ESO **Support, health and welfare** page  
<http://www.rhul.ac.uk/ecampus/welfare/disabledstudents/home.aspx>.

### 8.2 Student-staff committee

There is a student-staff committee on which both taught and research students are represented (for constitution see <http://www.rhul.ac.uk/iquad/collegepolicies/documents/pdf/compliance/committeeshandbookmarch2013.pdf>). The Committee meets three times each year and plays an important role in the Department as a forum for airing student views. You can use the Committee to raise any issues which concern students. Notices will appear on departmental notice boards giving details of forthcoming elections or the names of current representatives. You are also encouraged to attend the Postgraduate Forum.

### 8.3 Postgraduate committee

The Department's Postgraduate Committee meets at least termly and includes teaching representatives from all MSc programmes. It considers the development of the curriculum. Since the MSc is a postgraduate programme covering material at the forefront of research detailed content is likely to be updated annually to reflect recent developments in the field.

Annual monitoring is carried out by the Postgraduate Committee, and it includes an evaluation of individual courses and consideration of replies to the student questionnaires. The visits and guest lectures will also be evaluated from student responses. The Programme Director evaluates the course annually and makes a written report to the Faculty of Science. The Faculty considers this, alongside reports from the External Examiner as part of the annual review of taught masters courses.

External monitoring is carried out through a Visiting Examiner who has the right to request copies of any or all of the work on which assessments are based and can recommend that provisional marks assigned by internal examiners be adjusted. The Visiting Examiner is required to produce an annual report and can comment on any aspects of the programme including aims and objectives, academic standards, assessment procedures, structure, content, administration and delivery

### 8.4 Students' Union

The **Students' Union** offers a wide range of services and support, from entertainment and clubs/societies to advice on welfare and academic issues. The Advice and Support Centre, situated on the first floor of the Students' Union, runs a confidential service that is independent from the College. Open 9.30am - 5pm, Monday – Friday, it operates an open door policy exclusively for students during term time. However, during vacation periods students should call to book an appointment. Full details can be found at [www.su.rhul.ac.uk/support](http://www.su.rhul.ac.uk/support).

### 8.5 Careers information

The College has a **careers advisory service**, housed in the Horton Building, which is open to any student during normal College hours  
<http://www.rhul.ac.uk/careers/home.aspx>.

### 8.6 Non-academic policies

Please see the **Codes and Regulations** webpage  
<http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx> which includes information on non-academic policies, regulations, and codes of practice as well as the **Student Charter**  
<http://www.rhul.ac.uk/aboutus/governancematters/studentcharter.aspx>.

### 8.7 Complaints and academic appeals procedure

If you have a complaint relating to any aspect of the Department or its staff or to any academic or College matter, you should first discuss it informally with your Personal Advisor or with another member of staff in the Department. We would hope that the majority of issues of this kind can be resolved by informal discussion.

There are, however, procedures that can be invoked in serious cases. These are set out in the **College Complaints Procedures** for students <http://www.rhul.ac.uk/ecampus/academicsupport/academicappealsandcollegecomplaints.aspx>. You should raise your complaint **as soon as possible**.

If the complaint concerns an academic decision, there is an **academic appeals process**. Please note that an academic appeal can only be submitted once you have received your results via the College portal. Details of the **appeals procedures** and permitted grounds for appeal can be found on the following webpage <http://www.rhul.ac.uk/ecampus/academicsupport/academicappealsandcollegecomplaints.aspx>.

## 9 Health and Safety Information

### 9.1 Code of practice on harassment for students

This can be found on the student home pages under codes and regulations <http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx>.

### 9.2 Lone working policy and procedures

The College has a 'Lone Working Policy and Procedure' that can be found at <http://www.rhul.ac.uk/iquad/documents/pdf/healthandsafety/loneworkingpolicy2010.pdf>.

Lone working is defined as working during either normal working hours at an isolated location within the normal workplace or when working outside of normal hours. The Department and the type of work conducted by students is classified as a high risk activity and as such the following advice is relevant.

Any health and safety concerns should be brought to the attention of the Departmental Health and Safety Co-ordinator or the College Health and Safety Office.

It is likely that most activities will take place on College premises. However, the principles contained in the above section will apply to students undertaking duties off campus.

## 10 Equal Opportunities Statement and College Codes of Practice

### 10.1 Equal opportunities statement

The University of London was established to provide education on the basis of merit above and without regard to race, creed or political belief and was the first university in the United Kingdom to admit women to its degrees.

Royal Holloway, University of London (hereafter 'the College') is proud to continue this tradition, and to commit itself to equality of opportunity in employment, admissions and in its teaching, learning and research activities.

The College is committed to ensure that;

- all staff, students, applicants for employment or study, visitors and other persons in contact with the College are treated fairly, have equality of opportunity and do not suffer disadvantage on the basis of race, nationality, ethnic origin, gender, age, marital or parental status, dependants, disability, sexual orientation, religion, political belief or social origins
- both existing staff and students, as well as, applicants for employment or admission are treated fairly and individuals are judged solely on merit and by reference to their skills, abilities qualifications, aptitude and potential
- it puts in place appropriate measures to eliminate discrimination and to promote equality of opportunity
- teaching, learning and research are free from all forms of discrimination and continually provide equality of opportunity
- all staff, students and visitors are aware of the Equal Opportunities Statement through College publicity material
- it creates a positive, inclusive atmosphere, based on respect for diversity within the College
- it conforms to all provisions as laid out in legislation promoting equality of opportunity.

## 10.2 College codes of practice

Royal Holloway lays down firm codes of practice for its staff and students on the Academic Welfare of Students, on Freedom of Speech, on Sexual and Racial Harassment, and on Safety, Security and Parking. You will find these codes of practice in the [Online Student Handbook](http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx)  
<http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx>.

If you feel you are the victim of an infringement of any of these codes, or of any legal right, take the matter up with any of the following, as you see fit:

- your Personal Adviser;
- your Programme Director;
- the Head of Department;
- any other member of Department teaching staff you prefer to deal with;
- the Head of Support and Advisory Services (tel. 3395);
- the Student Counselling Service (tel. 3128);
- any Students' Union officer.

## Appendix 1: Lecture Courses

The following courses are taught jointly by King's, Royal Holloway, Queen Mary and University College staff. The MSci handbook gives full details of all courses and where they are taught. The MSci handbook and the timetable are available on Moodle and the MSci webpages <http://www.rhul.ac.uk/physics/informationforcurrentstudents/msci4thyear/msci4thyear.aspx>.

Course Code*	Course Title	Term
4100	Major Project	1,2
4201	Math Methods for Theoretical Physics	1
4205	Lie Groups and Lie Algebras	1
4211	Statistical Mechanics	2
4215	Phase Transitions	1
4226	Advanced Quantum Theory	1
4242	Relativistic Waves & Quantum Fields	1
4245	Advanced Quantum Field Theory	2
4261	Electromagnetic Theory	1
4319	Formation and Evolution of Stellar Clusters	1
4421	Atom and Photon Physics	1
4425	Advanced Photonics	2
4427	Quantum Computation and Communication	2
4431	Molecular Physics	2
4442	Particle Physics	1
4450	Particle Accelerator Physics	1
4472	Order and Excitations in Condensed Matter	2
4473	Theoretical Treatments of Nano-systems	2
4475	Physics at the Nanoscale	1
4476	Electronic Structure Methods	2
4478	Superfluids, Condensates and Superconductors	1
4501	Standard Model Physics and Beyond	2
4512	Nuclear Magnetic Resonance	2
4515	Computing and Statistical Data Analysis	1
4534	String Theory and Branes	2
4541	Supersymmetry & Gauge Symmetry	2
4600	Stellar Structure and Evolution	1
4601	Cosmology	1
4602	Relativity and Gravitation	1
4604	General Relativity and Cosmology	2
4605	Astroparticle Cosmology	2
4630	Planetary Atmospheres	2
4640	Solar Physics	2
4650	Solar System	1
4660	The Galaxy	2
4670	Astrophysical Plasmas	2
4680	Space Plasma and Magnetospheric Physics	2
4690	Extrasolar Planets & Astrophysics Discs	2
4702	Environmental Remote Sensing	1
4800	Molecular Biophysics	2
4810	Theory of Complex Networks	1
4820	Equilibrium Analysis of Complex Systems	1
4830	Dynamical Analysis of Complex Systems	2
4840	Mathematical Biology	2
4850	Elements of Statistical Learning	2

\* Course codes for UG MSci students are in the format PH4xxx, whereas course codes for PG students are in the format PH5xxx (eg PH4211 Statistical Mechanics as listed in the MSci Handbook becomes PH54211 when taken as part of a PG programme)

## Appendix 2: Euromasters Programme Specification

### PROGRAMME SPECIFICATION

This document describes the **MSc in Physics (Euro Masters)** programme offered in the Physics Department. This specification is valid for new entrants from **September 2013**.

This is a two-year programme designed to conform to the highest European (and international) standards. Similar programmes are available at other physics departments of the South-East Physics Network (SEPNet), a consortium of the departments from RHUL, QMUL and the Universities of Southampton, Surrey, Sussex and Kent. A key feature of the programme is the possibility of combining studies at more than one partner department; thus a student could spend one year at one department and the second at another.

The aim of this programme is to equip students for future careers, in the UK and internationally, including research in universities, industry and other organisations as well as to provide a technical background for a broader range of careers in the industrial scientific instrument sector and elsewhere. The programme is aimed, primarily, at overseas students from the EU and farther afield. The scope of the programme caters for a spectrum of students, from those whose predominant interest is in fundamental science, to those whose interests are more applied.

The aims of the programme are in accord with the College Mission Statement, with its emphasis on ensuring 'the highest quality of teaching and learning, led by active research and scholarship'.

In this programme we aim to provide a stimulating and supportive learning environment in which students will:

- develop an advanced knowledge of a chosen area of contemporary physics via lecture courses;
- obtain training in research techniques through lecture courses, directed study, and an individual project;
- develop key skills relevant for a postgraduate science student.

Upon successful completion of the programme students will be well-prepared for doctoral research in the best universities around the world.

The Department has close links with Rutherford Appleton Laboratory and the Harwell Science and Innovation Campus (including ISIS neutron spallation source and DIAMOND synchrotron x-ray scattering facility), Oxford Instruments plc (a major employer in the field), the National Physical Laboratory, CERN and other institutions. An important element of this programme, which ensures its wider relevance, involves external involvement in the programme. This entails:

- input on the course content;
- collaborative projects (some projects may involve time spent at these collaborators)
- visits to industrial facilities and laboratories;
- guest lectures.

## **Further Information**

[Learning outcomes](#)

[Teaching, learning and assessment](#)

[Details of the programme structure\(s\)](#)

[Progression and award requirements](#)

[Student support and guidance](#)

[Admission requirements](#)

[Further learning and career opportunities](#)

[Indicators of quality and standards](#)

[List of programmes, with details of awards, degree titles, accreditation and teaching arrangements](#)

This document provides a summary of the main features of the programme(s), and of the outcomes which a student might reasonably be expected to achieve if full advantage is taken of the learning opportunities provided. Further information is contained in the College prospectus, the College Regulations and in various handbooks issued to students upon arrival. Whilst Royal Holloway keeps all its information for prospective applicants and students under review, programmes and the availability of individual courses are necessarily subject to change at any time, and prospective applicants are therefore advised to seek confirmation of any factors which might affect their decision to follow a specific programme. In turn, Royal Holloway will inform applicants and students as soon as is practicable of any substantial changes which might affect their studies.

## **Learning outcomes**

The programme complies fully with Descriptors for a Masters level qualification set out by the Quality Assurance Agency for Higher Education in England and Wales (QAA) as all of its learning outcomes are at Masters (M) level. The programme conforms to the Bologna specifications (including the 'Dublin' Descriptors) for a Second Cycle qualification in both level and volume. In general terms the programme provides opportunities for students to develop and demonstrate the following learning outcomes:

### **Knowledge and understanding**

On successfully completing the programme a student should have a very good understanding of a range of physics topics and they will have increased their knowledge and understanding of the chosen topics. In particular they will have demonstrated:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the discipline;
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship;
- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline.

### **Skills and other attributes**

The students should develop a range of generic key skills as required by a scientific researcher, including:

- problem-solving skills – applied in new or unfamiliar environments;\*
- learning skills – including self-directed and autonomous study;\*
- investigative skills;\*

- information retrieval skills;\*
- communication skills – to both specialists and non-specialists;\*
- analytical skills;\*
- IT skills;\*
- personal skills such as teamwork and independence.\*

As a result of carrying out the research project students should develop research skills using a mix of experimental, theoretical and computational techniques appropriate to the field together with related transferable skills. The project will provide students with an opportunity for originality in developing and applying their ideas. Students should develop their communication skills and apply them to the writing of the project report and the presentation of an oral report on the project.

\* transferable skills

### **Teaching, learning and assessment**

A variety of teaching methods will be used, including lectures, directed study, seminars and one-on-one sessions. The Programme makes use of the Department's dedicated Audio-Visual suite so that courses may be shared with other institutions of the South-East Physics Network (SEPnet) and/or other colleges of the University of London.

Assessment is based on the Project thesis, course examinations and coursework. Full details of the assessments for individual courses can be obtained from the Department.

### **Details of the programme structure(s)**

The programme lasts for two academic years full-time, with each year comprising 60 ECTS. Lecture courses are delivered in 7.5 ECTS courses (MSci half-course units). The first year students will take six courses from the list below. The package of courses must be agreed with the Programme Director at the start of the first term. They will also conduct a double-course (15 ECTS) Project PH5100. In the second year students will conduct a Research Project PH5500 (60 ECTS) which will include research training, through directed study.

First year courses – the lecture courses are taught by members of the University of London intercollegiate MSci consortium. Courses taught by other members of the MSci consortium are detailed in the MSci Student Handbook. In that document each course has a four-digit number '4xxx'. In this programme the course is designated by the corresponding number 'PH5xxx'. Please note that the list of available courses offered is subject to change and not all courses run each year. A full list of courses including optional courses for the current academic year can be obtained from the Department.



Code	Course Title	ECTS	
PH5100	Project	15	compulsory
PH5201	Math Methods for Theoretical Physics	7.5	option
PH5205	Lie Groups and Lie Algebras	7.5	option
PH5210	Quantum Theory	7.5	option
PH5211	Statistical Mechanics	7.5	option
PH5226	Advanced Quantum Theory	7.5	option
PH5242	Relativistic Waves & Quantum Fields	7.5	option
PH5245	Advanced Quantum Field Theory	7.5	option
PH5261	Electromagnetic Theory	7.5	option
PH5317	Galaxy and Cluster Dynamics	7.5	option
PH5421	Atom and Photon Physics	7.5	option
PH5427	Quantum Computation and Communication	7.5	option
PH5431	Molecular Physics	7.5	option
PH5442	Particle Physics	7.5	option
PH5450	Particle Accelerator Physics	7.5	option
PH5472	Order and Excitations in Condensed Matter	7.5	option
PH5473	Theoretical Treatments of Nano-systems	7.5	option
PH5475	Physics at the Nanoscale	7.5	option
PH5478	Superfluids, Condensates & Superconductors	7.5	option
PH5501	Standard Model Physics and Beyond	7.5	option
PH5512	Nuclear Magnetic Resonance	7.5	option
PH5515	Computing and Statistical Data Analysis	7.5	option
PH5534	String Theory and Branes	7.5	option
PH5541	Supersymmetry and Gauge Symmetry	7.5	option
PH5600	Stellar Structure and Evolution	7.5	option
PH5601	Advanced Cosmology	7.5	option
PH5602	Relativity and Gravitation	7.5	option
PH5603	Astrophysical Fluid Dynamics	7.5	option
PH5630	Planetary Atmospheres	7.5	option
PH5640	Solar Physics	7.5	option
PH5650	Solar System	7.5	option
PH5660	The Galaxy	7.5	option
PH5680	Space Plasma and Magnetospheric Physics	7.5	option
PH5690	Extrasolar Planets and Astrophysical Discs	7.5	option
PH5670	Astrophysical Plasmas	7.5	option
PH5800	Molecular Biophysics	7.5	option
PH5810	Theory of Complex Networks	7.5	option
PH5820	Equilibrium Analysis of Complex Systems	7.5	option
PH5830	Dynamical Analysis of Complex Systems	7.5	option
PH5840	Mathematical Biology	7.5	option
PH5850	Elements of Statistical Learning	7.5	option

### Progression and award requirements

Students leaving or transferring to another SEPnet partner after completion of the first year will be awarded a Postgraduate Diploma in Physics (PGDip Physics) from RHUL.

To pass the PGDip programme a student must achieve an overall weighted average of at least 50.00%, with no mark in any element which counts towards the final assessment falling below 50%. Failure marks between 40-49% are not usually

condoned for the award of a Postgraduate Diploma, but if they are, such condoned fails would be in courses which do not constitute more than 25% of the final assessment, provided that the overall weighted average is at least 50.00%, but a failure mark (i.e. below 50%) in the Project cannot be condoned.

The PGDip degree with Merit may be awarded if a student achieves an overall weighted average of 60.00% or above, with no mark in any element which counts towards the final assessment falling below 50%.

The PGDip degree with Distinction may be awarded if a student achieves an overall weighted average of 70.00% or above, with no mark in any element which counts towards the final assessment falling below 50%. A Distinction will not normally be awarded if a student re-sits or re-takes any element of the programme. In exceptional circumstances a viva may be held for a student at the request of the Examiners.

In order to progress from the first to the second year of this MSc programme a student must achieve the standard of a PGDip in their first year. Students must pass the Project. Students must pass at least four of the taught courses, with an average of at least 50.00% over the six courses taken. Progressing students have the option to re-sit or re-take failed courses.

To pass the MSc programme a student must achieve an overall weighted average of at least 50.00%, with no mark in any element which counts towards the final assessment falling below 50%. Failure marks between 40-49% can be condoned in courses which do not constitute more than 25% of the final assessment, provided that the overall weighted average is at least 50.00%, but a failure mark (i.e. below 50%) in the Research Project cannot be condoned.

The Masters degree with Merit may be awarded if a student achieves an overall weighted average of 60.00% or above, with no mark in any element which counts towards the final assessment falling below 50%.

The Masters degree with Distinction may be awarded if a student achieves an overall weighted average of 70.00% or above, with no mark in any element which counts towards the final assessment falling below 50%. A Distinction will not normally be awarded if a student re-sits or re-takes any element of the programme. There is an oral examination, normally in the last week of the programme, at which the Visiting Examiner and at least one other examiner is present.

Students from other SEPNet partners and elsewhere joining the second year of the programme, having satisfied the admission requirements (to the second year) specified below, will be assessed on their second-year performance only.

### **Student support and guidance**

The Director of Graduate Studies holds an induction meeting for all new postgraduate students in the first week of the programme. The Programme Director is also normally present at this meeting. Formal aspects of being a member of the College and the Physics Department are discussed, and guidance on safety matters is given. Introductions are made to other members of the Department, the Library, computing facilities and other central services.

The Programme Director provides primary support for each student, including overall personal and academic welfare. The project supervisor provides additional academic support. Teachers of the lecture courses monitor progress on the courses. Supervisors and teachers provide progress reports on each student at each meeting of the Postgraduate Committee.

As this is a postgraduate programme, the social integration of students is achieved by incorporating them into the activities of the appropriate research group and other postgraduate activities and structures already in place in the Department. These include postgraduate seminars and meetings, research colloquia, Physics Society meetings and parties.

All other College support services are available to students on the programmes. These are described in the *College Student Handbook* and the *Student Union Handbook*. Part 1 of the Department's *Handbook for Physics Students* also contains useful information about facilities available in the Department.

Students worried about any aspects of the programme or the support they are receiving may consult the Programme Director or the Director of Graduate Studies at any time. At College level they may contact the Dean of the Graduate School.

### **Admission requirements**

Admission to the programmes depends on the applicant's qualifications and experience, which must satisfy the conditions of entry to the MSc degree established by the University of London. Graduates of British universities are normally required to have a First or Second Class Honours degree in Physics. Alternatively, students may have such a degree in a related subject such as electronics or engineering; such students will be expected to have taken courses in those topics relevant to their project and programme of study. Applications from candidates who hold other qualifications or who have relevant work experience will also be considered.

Entry to the second year of the programme will be available to students from the other SEPNet partners and other universities. Such students will be required to have successfully completed their first year to the PGDip level specified above, and to have an appropriate level of preparedness for the chosen Research Project, established by interview/discussion/examination results.

Students whose first language is not English may also be asked for a qualification in English Language at an appropriate level. For further details please refer to the Prospective Students web page. It may also be helpful to contact the Admissions Office for specific guidance on the entrance requirements for particular programmes.

### **Further learning and career opportunities**

This programme provides an ideal grounding for students to pursue PhD programmes in universities, and to equip them for future research careers in universities, industry and other organisations in Europe and around the world. The programmes will also provide a technical background for a broader range of careers in the industrial scientific instrument sector and elsewhere around the world. For more details on further learning and career opportunities please refer to the Careers Service.

### **Indicators of quality and standards**

Royal Holloway's position as one of the UK's leading research-intensive institutions was confirmed by the results of the most recent Research Assessment Exercise (RAE 2008) conducted by the Higher Education Funding Council (HEFCE). The new scoring system for the RAE 2008 measures research quality in four categories, with the top score of 4\* indicating quality that is world-leading and of the highest standards in terms of originality, significance and rigour. 60% of the College's research profile is rated as world-leading or internationally excellent outperforming the national average of 50%. The College is ranked 16<sup>th</sup> in the UK for research of 4\* standard and 18<sup>th</sup> for 3\* and 4\* research. 55% of the Physics Department's research profile is of 3\* and 4\* standard.

### **List of programmes**

The programmes are taught by staff at Royal Holloway, in conjunction with staff from other colleges of the University of London for some of the taught courses. The Masters leads to an award of the University of London. The Postgraduate Diploma leads to an award of Royal Holloway and Bedford New College. Postgraduate programmes in Physics are not subject to accreditation by a professional body. The Banner programme codes are given in parentheses.

- MSc in Physics (Euro Masters) (2441)
- PG Diploma Physics

## Appendix 3: Course Specification – PH5210

<b>Department:</b>	<b>PHYSICS</b>	<b>Academic Session:</b>	<b>201314</b>
<b>Course Title:</b>	Quantum Theory	<b>Course Value: Level:</b>	0.5 cu / 7.5 ECTS Masters
<b>Course Code:</b>	PH5210	<b>Course JACS Code:</b>	F342
<b>Availability:</b> )	Autumn Term	<b>Status:</b>	Optional
<b>Pre-requisites:</b>	None	<b>Co-requisites:</b>	None
<b>Co-ordinator:</b>	Dr A Ho		
<b>Course Staff:</b>	Dr A Ho, Dr S West		
<b>Aims:</b>	<p>To explain the main principles and ideas of non-relativistic quantum mechanics, its structure and its formalism.</p> <p>To examine both exact and approximate methods of solving quantum problems.</p> <p>To enable students to plan and carry out an assignment at the level of a theoretical project undertaken in a Masters course.</p>		
<b>Learning Outcomes:</b>	<p>On completion of the course, students should be able to:</p> <ul style="list-style-type: none"> <li>• understand and use the bra-ket (Dirac) notation for quantum states;</li> <li>• understand and use the vector space and matrix representation of operator formalism, expansion of any states in terms of some complete set, the ladder operator approach to the harmonic oscillator;</li> <li>• generalize the definition of angular momentum to include spin and solve the generalized angular momentum eigenvalue problem employing raising and lowering operator techniques;</li> <li>• discuss the properties of spin-<math>\frac{1}{2}</math> systems and use the Pauli matrices to solve simple problems; understand the concept and consequences of identical particles for fermions and bosons;</li> <li>• state the rules for the addition of angular momenta and to outline the underlying general, mathematical arguments, applying them in particular to two spin-<math>\frac{1}{2}</math> particles;</li> <li>• formulate first-order and second-order time-independent perturbation theory, and apply to some simple examples;</li> <li>• formulate the variational and WKB methods and apply to some simple systems;</li> <li>• formulate first-order and second-order time-dependent perturbation theory, and show how it can lead to Fermi's golden rule;</li> <li>• show their ability to plan, execute and report on a substantial theoretical assignment at a level appropriate to Masters.</li> </ul>		
<b>Course Content:</b>	<p><b>Formal Aspects of Quantum Mechanics:</b> Wavefunctions, principles of superposition, interference, state vectors and bra-ket (Dirac) notation, delta function. Compatible observers, simultaneous measurement and commuting operators. Expansion postulate and complete sets of states. The generalised uncertainty relations. Matrix representation of states and operators. Time dependent Schrödinger equation, expectation values, Hermitian operators, eigenstates, time evolution of operators. Periodic potential; Bloch theorem. Step-operator/ladder-operator approach to the harmonic oscillator, derivation of energy eigenvalues and wavefunctions (explicit forms for <math>n = 0, 1</math>).</p>		

	<p><b>The Hydrogen Atom:</b> Solution of the non-relativistic Schrödinger equation for an electron in the field of a stationary nucleus in spherical polar coordinates, obtain normalised eigenfunctions. Energy levels, angular momentum quantum numbers and their allowed values.</p> <p><b>Angular Momentum:</b> Review of commutation relations, eigenvalues and eigenfunctions of angular momentum operators, generalized angular momentum, step operator techniques in angular momentum theory; spectrum of angular momentum eigenvalues. Rules for combining angular momenta in general. Representation of spin-<math>\frac{1}{2}</math> operators by Pauli matrices, magnetic moments, Stern-Gerlach experiment.</p> <p><b>Approximate Methods:</b> Time-independent perturbation theory for non-degenerate system to second order in the energy; to first order for degenerate systems. Examples. Variational principle, He ground state example. WKB approximation. Further examples of applications of quantum mechanics to atomic, nuclear and solid state physics: spin-dependent interactions, interaction of a hydrogen atom with a strong uniform external magnetic field, the Stark effect, anharmonic oscillator.</p> <p><b>Identical Particles:</b> Exchange symmetry for a system with identical fermions or bosons; derivation of the Pauli principle. Independent particle model of He, singlet and triplet states, exchange interaction.</p> <p><b>Simple time-dependent systems:</b> Time dependent perturbation theory, interaction of a hydrogen atom with an oscillating electric field. Superposition of states of different energies. Electron in a magnetic field. Time evolution of entangled states of two spin-<math>\frac{1}{2}</math> particles with total spin zero. Transition to a continuum; density of states, Fermi's golden rule.</p> <p><b>Theoretical Assignment:</b> Review appropriate literature, perform calculations as directed, and provide a 2000-word report on an advanced level topic in quantum mechanics.</p>
<p><b>Teaching &amp; Learning Methods:</b></p>	<p>22 lectures, 12 hours work on assignment and 6 hours writing report, 5 feedback sessions</p> <p>123 hours spent learning material, answering coursework problems and revision.</p>
<p><b>Details of teaching resources on Moodle:</b></p>	<ul style="list-style-type: none"> <li>• Course outline</li> <li>• Lecture notes/summaries</li> <li>• Additional notes</li> <li>• Links to material of interest</li> <li>• Problem sheets and solutions (at the appropriate time)</li> <li>• Background material for theoretical assignment</li> <li>• Instructions for calculations and writing report for assignment</li> <li>• Links to past examination papers and selected solutions</li> </ul>
<p><b>Key Bibliography:</b></p>	<p><b>Recommended Purchase:</b> B H Brandsen &amp; C J Joachain, <i>Introduction to Quantum Mechanics</i>, Longman, 2<sup>nd</sup> edition 2000. (530.12.BRA)</p> <p><b>Further Reading:</b> Other books that will be useful: C Cohen-Tannoudji, B Diu, F Laloe, <i>Quantum Mechanics</i> vols 1 and 2, John Wiley 1977. (530.12.COH) S Gasiorowicz, <i>Quantum Physics</i>, John Wiley, 2003. (530.12.Gas) F Mandl, <i>Quantum Mechanics</i>, John Wiley, 1992. (530.12.Man)</p>

<b>Formative Assessment &amp; Feedback:</b>	Students answer assessed problem sheets, which will then be discussed during feedback sessions. Students will receive a feedback sheet on their report by the first marker.
<b>Summative Assessment:</b>	<b>Exam:</b> (60%) (2 hours) Three questions to be answered out of six <b>Assignment:</b> (30%) <b>Coursework:</b> (10%) <b>Deadlines:</b> Normally within 2 weeks from issue of problem sheets, report to be handed in by the first day of Spring Term.

The information contained in this course outline is correct at the time of publication, but may be subject to change as part of the Department's policy of continuous improvement and development. Every effort will be made to notify you of any such changes.

## Appendix 4: Course Specification - 2<sup>nd</sup> Year Research Project

<b>Department:</b>	<b>Physics</b>	<b>Academic Session:</b>	<b>201314</b>
<b>Course Title:</b>	<b>Research Project (Euromasters)</b>	<b>Course Value: Level:</b>	60 ECTS (4.0 cu) Masters
<b>Course Code:</b>	PH5500	<b>Course JACS Code:</b>	F300
<b>Availability:</b>	Autumn and Spring term	<b>Status:</b>	Compulsory
<b>Pre-requisites:</b>	None	<b>Co-requisites:</b>	None
<b>Co-ordinator:</b>			
<b>Course Staff:</b>	Academic staff of the Physics Department		
<b>Aims:</b>	<ul style="list-style-type: none"> <li>• To provide an opportunity for originality in developing and applying ideas in a research context.</li> <li>• To provide comprehensive preparation for physicists to pursue academic research or project work in industry in any physics-related discipline.</li> <li>• To provide a comprehensive understanding of some techniques of research, including the presentation of results.</li> <li>• To provide the high point of the Physics Euromasters degree.</li> </ul>		
<b>Learning Outcomes:</b>	<p>Upon successfully completing the course students should:</p> <ul style="list-style-type: none"> <li>• Be able to pursue academic research or project work in industry in any physics-related discipline.</li> <li>• have a comprehensive understanding of some techniques of research</li> <li>• be able to communicate their conclusions and the underpinning knowledge and rationale to both specialist and non-specialist audiences</li> <li>• be aware of the importance of teamwork in complex scientific work</li> <li>• have an impressive thesis on their project, which they can show at career interviews and discuss its content with confidence.</li> </ul>		
<b>Course Content:</b>	<p>This course is a research project occupying the final year of the two-year Physics Euromasters degree. Projects are associated with the research efforts of the Department and may be experimental, theoretical or computational. The course includes graduate-level research training in topics related to the project, through directed study, seminars and lectures.</p>		
<b>Teaching &amp; Learning Methods:</b>	<p>One hour per week of guidance from the supervisor.</p> <p>480 hours practical or theoretical work and 420 hours of private study, of which 60 hours spent in writing thesis and preparing talks.</p> <p>40 hours seminars, colloquia and lectures, 260 hours directed study and self-study.</p>		
<b>Details of teaching resources on Moodle:</b>	<ul style="list-style-type: none"> <li>• Course details</li> <li>• Seminar slides</li> <li>• Additional notes</li> <li>• Links to material of interest Links to past examination papers and selected outline solutions</li> </ul>		



<b>Key Bibliography:</b>	As agreed with supervisor.
<b>Formative Assessment &amp; Feedback:</b>	<p>Students must plan and schedule their work in consultation with their supervisor and advisor.</p> <p>There is a short oral presentation at the end of term 6. A draft of the thesis is read by the supervisor, prior to submission.</p> <p>Associated with the research training activities there will be an element of continuous assessment. This will be assessed on a pass/fail basis and marks will not contribute to the final assessment.</p>
<b>Summative Assessment:</b>	<p><b>Thesis not exceeding 20,000 words</b> - 80%.</p> <p><b>Oral and poster presentation</b> - 20%.</p> <p><b>Deadlines</b> - Thesis draft, Wed wk 10 Term 5. Thesis submission, Friday of wk 11 Term 6. Oral presentation in wk 12 Term 6.</p>

Version: Sep13

The information contained in this course outline is correct at the time of publication, but may be subject to change as part of the Department's policy of continuous improvement and development. Every effort will be made to notify you of any such changes.

## Appendix 5: Members of staff and their areas of responsibility

To call from outside the College dial +44 (0)1784 44xxxx for extensions 3xxx

+44 (0)1784 41xxxx for extensions 4xxx

+44 (0)1784 27xxxx for extensions 6xxx

Email addresses are of the form <name>@rhul.ac.uk

Posts within the department	Responsible person(s)	Room	Tel	email
Head of Department	Prof Brian Cowan	T114	3491	b.cowan
Senior Faculty Administrator	Tim Simmons	T115	3448	tim.simmons
Faculty Administrator (Undergraduate)	Gill Green	T116	3506	gill.green
Faculty Administrator (Research Support & Postgraduate)	Carmela Froggatt	T116	6265	carmela.froggatt
Faculty Administrator (Postgraduate Taught)	Claire Porter	W155	6464	claire.porter
<b>Undergraduate Programme Directors</b>				
Director of Undergraduate Studies	Dr James Nicholls	W160	3444	james.nicholls
MSci programmes	Dr Chris Lusher	W052	3492	c.lusher
BSc programmes	Dr Chris Lusher	W052	3492	c.lusher
Study Abroad	Prof Glen Cowan	W262	3452	g.cowan
Socrates/Erasmus	Prof Glen Cowan	W262	3452	g.cowan
<b>Year Tutors</b>				
Senior Tutor	Dr Philipp Niklowitz	W152	3499	philipp.niklowitz
First Year Tutor	Dr Philipp Niklowitz	W152	3499	philipp.niklowitz
Second Year Tutor	Prof Glen Cowan	W262	3452	g.cowan
Third Year Tutor	Dr James Nicholls	W160	3444	james.nicholls
Fourth Year Tutor	Dr Andrew Casey	W054	4351	a.casey
<b>Laboratory Organisers</b>				
Departmental Technical Operations Manager	Andy Alway	T113	3470	a.alway
Lab & Stores Technician	Ian Murray	T232	3483	ian.murray
Teaching Lab Assistant	Dr Michele Piscitelli	T232	3483	michele.piscitelli
First Year Laboratory	Dr Vladimir Antonov	T117	3462	v.antonov
Second Year Laboratory	Dr Veronique Boisvert	W259	3456	veronique.boisvert
Third Year BSc project	Dr Chris Lusher	W052	3492	c.lusher
Third year MSci Laboratory	Dr Gregoire Ithier	W059	3459	gregoire.ithier
Fourth Year MSci projects	Dr Andrew Casey	W054	4351	a.casey

### Postgraduate Programme Directors

Director of Graduate Studies	Prof Jon Goff	W051	3485	jon.goff
Postgraduate Admissions	Prof Jon Goff	W051	3485	jon.goff
MSc Physics Research	Prof Jon Goff	W051	3485	jon.goff
MSc EuroMasters	Prof Jon Goff	W051	3485	jon.goff

### Student Facilities

Responsible person(s)	Room	Tel	email	
IoP Representative	Dr Philipp Niklowitz	W152	3499	philipp.niklowitz
Educational Support Network Representatives	Dr Philipp Niklowitz	W152	3499	philipp.niklowitz
	Gill Green	T116	3506	gill.green
Colloquia	Dr Andrew Ho	W151	3196	andrew.ho
Special lectures	Dr Chris Lusher	W052	3492	c.lusher
Library Representative	Dr Tracey Berry	W153	3497	tracey.berry

### Careers

Careers Liaison Officer	Dr Chris Lusher	W052	3492	c.lusher
Alumni Officer	Prof John Saunders	W055	3486	j.saunders

### Safety

Safety Officer	Francis Greenough	W155	3487	f.greenough
Deputy Safety Officer	Andy Always	T113	3470	a.alway
Radiation Protection Officer	Andy Alway	T113	3470	a.alway

### First Aiders

Gary Boorman	T245	6311	g.boorman
Vijdan Cakli	W155	6465	vijsdan.cakli
Richard Elsom	W071	3484	richard.elsom
Gill Green	T116	3506	gill.green
Ian Murray	T232	3483	ian.murray
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## Appendix 6: Physics Academic Staff and their contact details

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