



**ROYAL HOLLOWAY**  
**University of London**

Mathematics Department

**Research Postgraduate Handbook**  
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# 1 Introduction

This *Handbook* is designed for use by all PhD and MPhil students in the Department of Mathematics.

This part of the *Handbook* serves as an introduction to the entire document. It contains a review of the scope and purpose of the document, general background information, and an overview of the contents of each of the main sections.

## 1.1 Scope and purpose

The main purpose of this document is to outline the role and responsibilities of a research student within the Royal Holloway Mathematics Department<sup>1</sup>. Much of the information is of a general advisory nature, but there are also specific rules and regulations which must be followed. It is important to note that this *Handbook* is not intended to replace any of the formal regulatory documents published by the college and the university (see also section 1.3 below).

This document refers almost exclusively to PhD students. However, this *Handbook* is also applies equally to MPhil students, including both students wishing to study for a PhD who are initially registered for an MPhil (see also section 3.5), and students who only intend to complete an MPhil degree.

## 1.2 Roles and responsibilities in the department

The *Director of Graduate Study (DoGS)* is the member of staff within the Mathematics Department with overall responsibility for PhD student admissions and the overall administration of PhD students. Each research student has a *Supervisor*, who is responsible for the student's research programme, and an *Adviser*, who can advise on academic and welfare matters. For a full statement of the responsibilities of the supervisor and advisor see the College's *Code of Practice* (see section 1.3).

## 1.3 Background information

All students are expected to make themselves familiar with the relevant regulations and codes of practice. It is important to note that the examination of PhD students is managed by the University of London, according to university regulations. It is therefore important for students to be aware of both the college and the university regulations, as well as the college Code of Practice.

The College's *Academic Regulations* are available at:

[http://www.rhul.ac.uk/Registry/academic\\_regulations/](http://www.rhul.ac.uk/Registry/academic_regulations/)

The College's *Code of Practice for the Academic Welfare of Postgraduate Research Students* can be found at the same location.

The University of London Regulations for the Degrees of MPhil and PhD are available at:

[http://www.london.ac.uk/research\\_degrees.html](http://www.london.ac.uk/research_degrees.html)

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<sup>1</sup> Note that this includes students registered both for Mathematics and for Information Security. That is, this *Handbook* is intended for use by all research students supervised by members of staff of the Mathematics Department, including those who are members of the Information Security Group.

## **1.4 Electronic resources for PhD students**

A variety of information useful for PhD students can be found on the ISG and Mathematics web pages – see:

<http://www.isg.rhul.ac.uk/phd>

and

<http://www.ma.rhul.ac.uk/prospective/phd.html>

Useful information on a range of topics can also be found on the Graduate School web pages:

<http://www.rhul.ac.uk/graduate-school/>

Finally, a range of resources for PhD students can be found at:

<http://www.isg.rhul.ac.uk/~cjm/Training.htm>

## **1.5 Structure of document**

This document has the following main sections.

- This first section is introductory in nature and introduces the purpose and scope of the *Handbook*.
- In section 2, the processes that should be followed by a new student are described, including the induction process and training. Note that whilst training is covered in this section, training is something applicable to PhD students throughout their time at Royal Holloway.
- This is followed by the central part of the document, namely section 3 on the student-supervisor relationship. A variety of topics related to day to day interactions with supervisors are covered.
- The final main part of this document, section 4, is concerned with the completion of a PhD degree, including the submission and examination of the thesis.

## **1.6 Availability of this document**

This document is available both in hard copy form (ask the DoGS for a copy) and electronically at:

<http://www.isg.rhul.ac.uk/~cjm/DoGS/RPGH.pdf>

The document will be updated at regular intervals; however, hard copies of updates will not be routinely distributed. The electronic version will be kept up to date.

## **1.7 Errors in this document**

This document no doubt contains many errors and omissions, for which the author apologises in advance. All suggestions for improvement should be sent to the DoGS.

## **2 Getting started**

This part of the *Handbook* is concerned with the procedures that should be followed when a PhD student first enrolls.

### **2.1 Registration**

All new students must register with the college. This process is not something in which the department or the supervisor is directly involved. However, until a student has officially registered, he or she cannot get a library card, college email address, or any other services provided by the college.

Once a student has registered, he/she is entitled to a library card and an email address (the latter must be obtained by applying at the Computer Centre). Only once the student has an email address can he/she be enrolled within the departmental computer system.

### **2.2 Induction week**

During induction week, all PhD students starting at the beginning of an academic year should attend two induction meetings (and probably much else besides). The college runs an induction meeting for all new PhD students, to which new students will be invited by the college. Within the department, the DoGS will set up a separate induction meeting, typically on the Friday lunchtime of induction week. All new students are invited, together with as many as possible of the supervisors and advisers of the new students.

At this meeting the DoGS provides a range of information to the new PhD students, together with various forms for each student to fill out.

### **2.3 Facilities**

All full-time research students are provided with office space in a shared room. PCs are provided for all research students in the postgraduate student offices. Unfortunately we do not have the space to allocate writing-up research students an individual desk. These rooms are provided with a telephone which may be used to make and receive calls from outside as well as internal calls. Please do not abuse this facility. There is a system for logging private calls for billing.

All postgraduate students are welcome to use the department library in McCrea room 237, and the adjacent kitchen. Tea and coffee may be made at any time, and there are also a fridge and a microwave cooker. Please put your dues into the tin! There are some cups and saucers available but most people find it convenient to provide their own mug. The department has a collection of books and periodicals housed in room 237. These may be borrowed, but please enter any such borrowings in the book provided.

When you first arrive please make sure that you obtain your Computer Centre user ID and password as soon as possible. You will normally receive these as part of the enrolment process. Please look after this information carefully, as you will need it for access to the college computing facilities.

Research students have shared post boxes in McCrea room 221, and may also use the photocopier in this room.

Finally, please note that a range of support can be provided by the departmental office (in McCrea room 243) This includes the provision of basic stationary, a contact point for computing queries, and arrangements for travel bookings and expense claims. Please note that, if your travel costs are to be refunded by the college (and prior authorisation must always be sought), then a quote must first be obtained from the college travel agent. Unless you can obtain a lower price than that quoted, you must use this travel agent.

## ***2.4 Initial meeting with supervisor***

An initial meeting with your supervisor should be arranged as soon as possible after you arrive. Every supervisor has his or her own style of managing the development of their research students, but your first few meetings with your supervisor are likely to cover the following issues.

- You should agree with your supervisor on an initial focus for your research work. This might typically involve reading around a particular focussed research topic. It is useful to bear in mind that, at some point in March or April of your first year, you, along with every other new student, will be required to give a presentation on a topic you have covered in your initial work (see section 2.6 below). Commonly this is the result of this initial piece of research work. Ideally this initial piece of work should involve extensive use of document searching and retrieval facilities, including those offered by the library and also the various online systems to which access is available.

You are very strongly encouraged to attend all the departmental seminar and workshop series that have some relevance to your research. Moreover, you are encouraged to attend all seminars in a series, even if some are not really directly related to your work. There would appear to be general agreement that attendance and participation in research seminars is a vital part of the research development of every student. It also greatly helps you to become part of the research student community, which is in itself a very valuable part of the student experience. By and large, successful students do best when they help each other.

It is also worth making special mention of the research student only seminar series run within the department. You are encouraged to take an active role in both attending and giving seminars attended only by your peers. This is another important step in the student development process.

- You should make any necessary arrangements with your supervisor regarding routine research meetings. For example, if your supervisor operates an appointment system, then you should find out how this works. In general, the department encourages an informal relationship between students and staff, and we all believe that you are an important and valued part of the research life of the department.
- You should discuss your training needs with your supervisor – if you have special training needs not catered for by the college or departmental training activities then the DoGS should be informed to see if special arrangements can be made. In general, you are encouraged to take full advantage of the broad range of training opportunities provided by the college (see also section 2.5 below).
- You should introduce yourself to your adviser as soon as possible during the academic year. You are also encouraged to go and see your adviser if, for any

reason, there are problems that cannot be resolved by your supervisor (or just if you would like a second opinion).

- You are encouraged to discuss academic and study problems with other members of staff (particularly your adviser and the DoGS). You are also encouraged to pass any issues on to the PhD student representative on the departmental staff-student committee. This representative provides an anonymous channel for issues that need to be addressed by the department.

## **2.5 Training**

At your initial meeting with your supervisor, you should, with your supervisor's assistance, complete a *Training Log Form* (an example is given in the appendix). As discussed in section 2.4 above, this form should be used to identify your training needs.

As a fundamental part of the first year training, and in addition to the range of courses provided by the college, all students are expected to produce at least one substantial report on their work, and to give at least one presentation; of course, all students are encouraged to take an active role in seminars from the earliest possible point.

As part of your first year development, every student should learn how to use a suitable document preparation system. In the past most students have been strongly encouraged to learn the use of LaTeX at an early stage, in that this system is particularly suitable for preparing academic documents. In parallel with this, all students should develop skills in writing academic papers and the delivery of seminars and research presentations.

The college provides a wide range of training courses as part of the *Research Development Programme* (RDP). All students are required to participate in this programme. Full details of the courses on offer as part of this programme (which are designed to cover the needs of students at every stage of their research, not just first year students) are available at:

<http://www.rhul.ac.uk/graduate-school/pages/rdp.html>

All courses provided as part of the RDP may be booked electronically using the above website.

The precise details of the RDP courses will vary, and students should be encouraged to consult the site regularly. At the time of writing, courses are available on the following topics:

- Managing your research;
- An introduction to Information Services;
- Communicating your research;
- Creativity, motivation and personal effectiveness;
- Preparing for the viva;
- Academia, research and beyond – preparing for your future career;
- Managing your stress levels;
- Directing creativity;
- Facing the media.

The Language Centre runs in-sessional courses on English for those students who first language is not English – see:

<http://www.rhul.ac.uk/language-centre/index.html>

If you are not a native English speaker, you are strongly encouraged to take advantage of these courses. Writing a PhD thesis does require a highly sophisticated command of written English.

Short courses are also arranged by the Department of Information Services. Details of these are available at:

<http://www.rhul.ac.uk/information-services>

The Graduate School also provide an online discussion forum for research students to exchange ideas, questions, and so on. This is available at:

<http://discussion.rhul.ac.uk/>

Finally, the department runs a significant number of advanced (masters level) courses in both Mathematics and Information Security. All students are encouraged to attend any courses which are likely to be of assistance to their research. Similar remarks apply to undergraduate courses.

## **2.6 First year student presentations**

Every year, at some point before the beginning of the third term, the DoGS will arrange a day (or days) at which all first year PhD students will be expected to give a presentation of 30 minutes or so (including questions). All supervisors and other PhD students are encouraged to attend and take part, in what is typically a very rewarding experience for all concerned. The subject of the talk is a matter to be agreed by the student and supervisor, although it would typically relate to work undertaken during the first few months of your time at Royal Holloway.

As well as being invaluable experience for the student, this talk is a key step in the progression towards transfer of registration from MPhil to PhD (see section 3.5).

## **2.7 Communications**

It is extremely important that you stay in touch with your supervisor, and with the department more generally. As a result it is vital that you monitor your email regularly (e.g. to receive messages from your supervisor, seminar announcements, etc.) – if necessary put forwarding arrangements in place. You should automatically be added to a departmental list of PhD students, otherwise you may miss important announcements. Please check that you are on this list, and, if not, please let the Computer Centre, your supervisor and the DoGS know<sup>2</sup>.

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<sup>2</sup> Sometimes the Computer Centre is not always as quick at fixing such problems as would be desirable, which is why letting members of staff know of such problems can help!

## **3 Interacting with your supervisor**

The discussion in this section is concerned with matters relating to the day to day supervision of PhD students.

### **3.1 General remarks**

Within the Mathematics Department we have always sought to operate an ‘open door policy’, in which students are encouraged to see their supervisors as and when they wish. Students and supervisors should meet frequently at seminars, short courses, morning coffee breaks, etc., and if this occurs then it is easy for progress to be monitored. Historically we have found that this system encourages independent, self-motivated, original research.

A detailed list of the obligations of supervisors towards their research students (and vice versa) is provided in the Code of Practice (see section 1.3).

**Please note the particular importance of the 4-year registration limit for all full-time PhD students, applying to all students registering on or after September 2006 (see also section 4.1).**

### **3.2 Supervisory meetings**

Formal appointments for meetings between students and supervisors may or may not be necessary. In any event, students are strongly encouraged to meet their supervisors frequently on an informal basis; typically the frequency of such meetings is between once a week and once every two or three weeks (not counting social encounters). It is important for research students to meet their supervisors regularly to discuss their work, and also discuss any other problems that may arise. Students often get ‘stuck’, and a supervisor can often help students get past obstacles which may otherwise completely stop their progress.

Apart from the routine informal meetings, there is a college requirement on all students to meet their supervisors formally from time to time. The departmental policy is that there should be (at least) four formal meetings between supervisor and student in every academic year. Three of these meetings will typically take place at the end of each academic term, and the annual review (typically occurring in September of each year) will constitute the fourth meeting.

These formal meetings should result in the production of a set of minutes, listing all actions agreed by supervisor and student. The minutes should also record any other matters of significance agreed in the meeting. The minutes should normally be produced by the student after the meeting, and then emailed to the supervisor for checking. It is important that the minutes be an agreed record of the meeting, and that copies are kept by both supervisor and student.

### **3.3 Ongoing student development activities**

It is, of course, vitally important that students continue to develop their research skills throughout their time at Royal Holloway. Research skills here covers not only the ability to perform research itself, but also associated skills such as the ability to write coherent, sound and well-structured academic papers, the ability to present (and defend) research in public forums, and so on.

There are many ways in which these skills can be developed, both by individuals, and by the department and college as a whole. In the latter category fall the variety of training courses offered by the college (see section 2.5 above), which students are very strongly encouraged to take full advantage of. Nevertheless, it is important to appreciate that the supervisor remains the primary source of training for every student.

There are a number of things that every research student can do to assist his/her own development, over and above the normal discussions of research which take place during routine informal meetings between student and supervisor.

- All students are expected to attend all relevant departmental seminar series and discussion groups, including individual lectures which may not seem directly relevant to their research.
- Students should write up and publish their results in a timely fashion (see also section 3.10). Of course, as with writing the thesis itself, students will typically need detailed advice from their supervisor on style and presentation of material, which may involve reading and providing detailed comments on many drafts of a paper.
- Ideally, all students should attend one or more national and/or international research conferences during their period of registration. Conferences enable students to meet workers in their research field from other institutions worldwide, and are a very important source of inspiration and information. Some funding may be available to help with such activities, in particular if the student has had a paper accepted at the conference. You should discuss the rationale for attending the meeting with your supervisor and, if your supervisor gives his/her support, you should then approach either the Head of Department or the Director of the ISG (as appropriate), to obtain clearance for Departmental funding.
- The UK Grad Programme (<http://www.grad.ac.uk>) runs residential courses that students have found enjoyable and useful. You are encouraged to attend one of these.
- The opportunity arises for some students to get teaching experience by taking tutorials, workshops, and/or computer laboratories, as well as by marking coursework.

### **3.4 Annual reviews**

At the end of each academic year, the progress of every PhD student must be monitored by means of a formal Annual Review. This will involve a formal meeting between you, your supervisor and your adviser. At the meeting the adviser and supervisor (and anyone else present) should seek to understand the progress you have made towards your PhD, and provide feedback on your progress and future research plans. The discussion at the meeting should be sufficiently detailed to enable the supervisor and adviser to complete the annual review report form.

Whilst the precise form of the review meeting is up to the supervisor, the following arrangements are typical.

1. The supervisor will ask you to prepare a short (e.g. 15-minute) presentation covering the research work you have conducted over the past year, what you plan to do in the coming year, and also mentioning any training and development activities you have undertaken. You will typically be asked to give a relatively high level view of your work, rather than going into detail. Of course, if you are

approaching the three year mark, then it would also be reasonable to expect you to present plans for completion of your thesis. This presentation would be given towards the beginning of the review meeting, and you should expect to answer questions from those present.

2. You will also be asked to produce a short (e.g. two pages) written report covering much of the same ground as the presentation, to be circulated either prior to the meeting or at the meeting itself. Again you should be prepared to discuss any issues arising from this report during the review meeting.
3. The issue of your training needs should be covered during the review. The training activities you have undertaken should be reviewed, and, where necessary, you are encouraged to take those relevant courses in the Research Development Programme which you have not previously taken (see also section 2.5 above).

All reviews should be completed by the end of September at the latest.

### **3.5 MPhil to PhD transfer of registration**

As stated in paragraph 26 of the *Code of Practice* – see:

[http://www.rhul.ac.uk/Registry/academic\\_regulations/PGR\\_Code\\_of\\_Practice.html](http://www.rhul.ac.uk/Registry/academic_regulations/PGR_Code_of_Practice.html)

all research students are registered initially for the degree of MPhil, with the opportunity of transferring to PhD status after one or two years following a formal review of progress. Only when candidates are exceptionally well qualified – for example if he/she already holds an MPhil degree – will the College consider initial registration for the PhD degree.

The decision that a transfer of registration is appropriate could be made as part of a student's annual review, or it could be made at a separate meeting. The latter will only normally be necessary when you are not transferred at the first annual review meeting (and the issue of a possible transfer will certainly be discussed by the supervisor and adviser at the first annual review meeting). In any event, any decision to transfer your registration can only be taken with the agreement of the supervisor and adviser, or a person acting in place of the adviser.

The following conditions must be met by any student who is transferred from MPhil to PhD.

1. The supervisor and adviser should be convinced that the student is capable of obtaining a PhD degree. This decision should take into consideration the work that the student has performed since first registering for the degree.
2. The student shall have given at least one presentation to a general audience on a research topic. This requirement will normally have been met through participation in the First Year Student Presentation Day (see section 2.6 above). Of course, as discussed in section 3.3 above, all students are encouraged to take an active role in departmental seminars.
3. The student shall have completed at least one piece of written work on a research-related topic. Whilst this does not need to be publishable, it should nevertheless relate to possible research directions for the student. Possible examples of suitable piece of work include:

- a detailed discussion of a research paper, e.g. rewriting the results in the student's own notation and providing some discussion of the research results and possible unsolved problems;
- a review of a research topic, covering the major published work and highlighting the unsolved research problems;
- a publishable paper.

If there is agreement that the student merits being transferred to registration for a PhD, then the supervisor will complete the necessary paperwork.

### **3.6 Role of adviser**

As described in the Code of Practice (see section 1.3), the main duties of an adviser are to:

- participate in the annual review process (see section 3.4), and also in the procedure for transfer of registration (see section 3.5);
- where necessary, act in place of the supervisor if the supervisor is absent for any significant period of time.

With respect to the second main duty, the Code of Practice makes specific mention of two situations in which an adviser might be required to act in the place of a supervisor, namely when a supervisor takes a period of sabbatical leave, or if the supervisor leaves the institution. However, in neither of these cases (or in any other case) should it be automatically assumed that the adviser will always 'take over' as supervisor. An adviser shall only be expected to act in place of a supervisor as a short term 'emergency' arrangement, e.g. in the case of supervisor illness, until such time as more permanent arrangements have been made (typically involving the DoGS). For further details of temporary or permanent transfers of supervisory responsibilities, see section 3.9 below.

### **3.7 Interruption of studies**

From time to time it may be necessary for a PhD student to take a break in his/her research. This could arise for a wide range of reasons, including student illness, family problems (including illness of family members), or changes of financial circumstances. In such a case, you are advised to seek a period of *Interruption of Studies*. During such a period you are not expected to pay fees, but in return should not expect the normal detailed research guidance from your supervisor. Applications for such interruptions will need the support of your supervisor, and supervisors will look upon (genuine) requests sympathetically.

### **3.8 Student status**

Every current research student must be registered with one of the following statuses:

- full-time;
- part-time;
- interruption of studies (see section above); or
- writing up.

Note that, before a student is entitled to transfer to writing up status, he/she must have completed three years as a full-time student or six years as a part-time student (periods spent on interruption of studies do not count towards this total). Because of pressure of space within the department, only full-time students will automatically be entitled to a desk in a shared office. However, space constraints permitting, it is intended that writing-up and part-time students will have access to a shared desk in one of the research student offices.

### ***3.9 Changes of supervisor/adviser***

There may be a number of reasons for a temporary or permanent transfer of supervisor. However, regardless of the type of transfer (i.e. temporary or permanent) and the reason for the transfer, you must always be consulted, and you should be satisfied with the new supervisory arrangements. Changes of student adviser shall also only be made with the full knowledge and consent of the student.

In the case of a period of sabbatical leave, leave of absence, or any other extended period of absence, your supervisor is responsible for making arrangements for your supervision while he or she is absent. This may, of course, involve the adviser, but this shall never automatically be assumed, and it is up to the supervisor to make all such arrangements before the period of absence commences; the supervisor must also ensure that the student(s) concerned are happy with the arrangements made.

Permanent transfers of students from one supervisor to another may also arise for other reasons, including the following.

- Students may request to be transferred to another supervisor, e.g. because he/she has been working with another member of staff on an informal basis and wish to make this arrangement more formal. This is often a natural process, and students are not discouraged from transferring from one supervisor to another, as long as the new supervisor is happy with the transfer.
- The research interests of a student may change, and as a result a different supervisor may be more appropriate.

### ***3.10 Writing papers***

When you have made sufficient progress, you should consider writing up your results as a paper for publication in a conference or journal. This will, of course, be of value to you in seeking employment after completion of the Ph.D. degree, and presenting a paper at a conference will also provide you with invaluable experience in presenting your work.

Whether or not the name of your supervisor should be included as a co-author of a student paper is a matter for you and your supervisor to decide. It is a common (although not universal) practice for the supervisor name to be included only when the supervisor has made a significant contribution to the paper – e.g. when a supervisor has done significantly more than give general guidance in writing style and correct minor mistakes.

The question of the order of author names is again something that is at the discretion of student and supervisor. The custom in some parts of the Mathematical Sciences (e.g. in at least some branches of Pure Mathematics) is always to put names in alphabetical order, even when one author has contributed much more than another. However, in

other areas (e.g. in much of Computer Science) it is customary to use alphabetical order only when the authors have made roughly equal contributions, and otherwise to put the main author first – in such a case in normal circumstances all papers that a student writes should list his or her name first.

Finally, you are reminded that the college owns the intellectual property of all research that you conduct as part of your Ph.D. (unless alternative arrangements have been made, e.g. in the case of industrially sponsored students).

### **3.11 Attending academic conferences**

As mentioned in the previous section, during your time at Royal Holloway you will probably write one or more research papers, and you will wish to have some of these papers presented at appropriate research conferences. The department does have some funds to support conference attendance, so please do not be put off by the cost. However, if you wish to get departmental support, it is vital that you obtain authorisation *before* making any commitments. As discussed in section 3.3, you should discuss the meeting with your supervisor and, if your supervisor gives his/her support, you should then approach either the Head of Department or the Director of the ISG (as appropriate), to obtain clearance for Departmental funding.

### **3.12 Student-staff committee**

Liaison between staff and students occurs informally on a daily basis through personal contact and formally through the *Student-Staff Committee*. The Committee consists of two student representatives elected from each undergraduate year group (except that there is only one representative from the fourth year), one taught postgraduate representative, one research postgraduate representative, and staff representatives. It has the wide-ranging brief to discuss any and all matters of interest or concern to students. It normally meets two or three times a term in the first two terms, and once in the final term.

A separate committee exists for the Information Security masters degree.

Photographs of the student representatives, the agenda and minutes of meetings are displayed on the departmental notice board. Items for the agenda should be raised with the research postgraduate representative, who is elected by the research postgraduate student body on an annual basis.

## **4 Completing the degree**

### **4.1 Limits to the period of registration**

As specified in clause 25(c) of the college postgraduate regulations – see:

[http://www.rhul.ac.uk/Registry/academic\\_regulations/Postgraduate\\_Regulations.html](http://www.rhul.ac.uk/Registry/academic_regulations/Postgraduate_Regulations.html)

‘students first registered on programmes leading to the award of PhD in or after September 2006 must submit the thesis for examination within four calendar years of full-time study, or seven years of part-time study, excluding any formal interruptions of studies approved under the provisions of paragraph 26, otherwise their registration on the programme may be terminated under the provisions of paragraph 76’.

Similarly, with respect to MPhil students, it is stated in clause 25(b) that ‘students first registered on programmes leading to the award of MPhil in or after September 2006 must submit the thesis for examination within three calendar years of full-time study, or five years of part-time study, excluding any formal interruptions of studies approved under the provisions of paragraph 26, otherwise their registration on the programme may be terminated under the provisions of paragraph 76’.

### **4.2 Writing up**

Once you have achieved sufficient progress in your research then you will need to prepare a thesis reporting on this research. Clearly, an important role of your supervisor is to give advice to you when this point has been reached. Of course, in many cases it will not be completely clear whether or not there is sufficient material until the writing up process is well under way – in any event, it is much better for you to start on the writing up process earlier rather than later. The act of writing up will itself often prompt a student to do the extra work necessary to fill in obvious gaps in the research.

The role of the supervisor in helping a student prepare a well-structured thesis with appropriate content is crucial. Research students often have little idea of how to prepare such a major document (of course, you may be an exception!). You are strongly advised to prepare a structure for approval by your supervisor before starting to write the thesis, and you are also strongly encouraged to seek advice from your supervisor during the writing process itself. Consulting existing theses on related topics is also a very worthwhile exercise. Many theses produced by recent PhD students are available as departmental technical reports, and all graduating students are encouraged to make their thesis available to a wider readership in this way. Departmental technical reports are available at:

<http://www.ma.rhul.ac.uk/techreports/>

### **4.3 Submitting for the examination**

When you near the end of your studies (typically once you have started writing up their thesis in earnest), you will need to formally enter for the Ph.D. examination. This involves completing certain forms, available from the college registry. The process is described in clause 5 of the Ph.D. degree regulations, available at:

[http://www.london.ac.uk/research\\_degrees.html](http://www.london.ac.uk/research_degrees.html)

Students should take especial note of clause 5.3, which states that: ‘The entry form ... must be submitted at least four months before the submission of the thesis’. This means that, if the thesis is nearing completion, you should enter for the examination as soon as possible.

#### **4.4 Choosing examiners**

Two examiners must be appointed by the University of London to examine every student who submits a thesis. Normally, one examiner will be internal to the university and one external. Whilst the formal appointment of examiners is outside the control of the supervisor, he/she is nevertheless required to nominate candidates for these two roles. This is not something in which you as a student will be involved.

Note that the internal examiner may be from Royal Holloway or from any other college of the university. Note also that neither the internal nor the external examiner should have worked with the student prior to the examination, or have any other significant connection with the student (e.g. advisers should not normally act as an internal examiner).

#### **4.5 Submission of the thesis**

Precise details of the formal requirements for thesis submission are given in the University of London Regulations (see section 1.3). However, at the time of writing, a student is required to submit two copies bound in accordance with the university regulations.

It typically takes several weeks for the submitted copies to reach the two examiners.

Note that the student must not make any direct contacts with the examiners prior to the examination.

#### **4.6 The oral examination**

Your supervisor is responsible for arranging the oral examination, including negotiating the date and time with the examiners, booking a room in which to conduct the examination, etc. Typically, oral examinations will be held in the department at Royal Holloway.

Guidance on the conduct of the oral examination is available at the University of London website:

[http://www.london.ac.uk/research\\_degrees.html](http://www.london.ac.uk/research_degrees.html)

The supervisor may be present at the examination if the student wishes. Past practice in this area varies; some supervisors never attend Ph.D. oral examinations, whereas others always attend. This would appear to be another area where practice appears to depend on the subject area – attending oral examinations appears to be quite common for supervisors in Computer Science and Electrical Engineering, whereas it does not appear to be so in Pure Mathematics. If the supervisor is present during the examination, he or she can act only as an observer, and may only speak if requested to do so by the examiners.

It is often useful for a student to arrange a ‘mock’ oral examination, prior to the real thing, where two members of staff (e.g. the supervisor and adviser) spend an hour or so acting as the internal and external examiners. This will enable you to get a feel for what types of question you might be asked.

## **4.7 After the examination**

There are a number of possible outcomes from an oral examination ranging from 'pass with no changes' (the best possible outcome), to 'fail with no possibility of resubmission' (very rare). In the past, the most common result has been a pass subject to the student making changes and corrections to meet specified points made by the examiners.

If corrections are required, the nature of the corrections, and the methods to be used to verify that the changes have been made in accordance with the wishes of the examiners, will vary. In many cases the external examiner will be happy to let the internal examiner do the necessary checks.

You should seek guidance from your supervisor during the corrections process; this might typically involve the supervisor reviewing a draft of the corrected thesis before it is sent to the examiner(s) for final checking.

## 5 After you have finished

We hope that you will have fond memories of your time with Royal Holloway, and we would like to encourage you to stay in touch. One means of staying in touch is via the ISG and Mathematics alumni web pages, at

<http://www.isg.rhul.ac.uk/alumni>

and

<http://www.ma.rhul.ac.uk/alumni/>

The college also runs alumni events, see:

<http://www.rhul.ac.uk/For-Alumni/#>

We look forward to seeing you regularly in the future.