



SCOIL NA MATAMAITICE | SCHOOL OF MATHEMATICS
COLÁISTE NA TRIONÓIDE, BAILE ÁTHA CLIATH | TRINITY COLLEGE DUBLIN
Ollscoil Átha Cliath | The University of Dublin

Handbook

Postgraduate Research Degrees

2012-2013

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Chapter 1

Introduction

The School of Mathematics has a strong research programme in pure and applied mathematics and theoretical physics. For postgraduate students who wish to engage in research projects the school offers both masters by research (M.Sc.) and doctoral degrees (Ph.D.). The general rules governing research degrees at Trinity College Dublin¹ can be found in the university calendar part 2 (www.tcd.ie/calendar). The purpose of this handbook is to provide additional information specific to the School of Mathematics, and to serve as a – hopefully useful – starting point for current and prospective students who look for information.

<p>Disclaimer: Should a conflict arise between information given in this handbook and the university calendar, the university calendar takes precedence!</p>

Members of the School of Mathematics come from a broad range of diverse backgrounds and this is seen as an opportunity to learn from each other. The school strives to create and maintain a stimulating scholarly atmosphere, based on mutual respect. All members of the school are expected to be aware of the College's dignity and respect policy:

<http://www.tcd.ie/about/policies/respect.php>

¹Trinity College is the only college which constitutes the University of Dublin. Although the University of Dublin and Trinity College Dublin are, strictly speaking, different entities we here follow local customs and treat both terms as synonymous.

Chapter 2

General Information

2.1 School contacts

The person responsible in the school for postgraduate research studies is the Director of Teaching and Learning (postgraduate) (DTLP). Contacts for postgraduate matters in the school:

DTLP:	Prof. Stefan Sint	sint@maths.tcd.ie	896 8559
Executive officer:	Ms. Helen Murphy	hmurphy@maths.tcd.ie	896 1949
School administrator:	Ms. Karen O'Doherty	kod@maths.tcd.ie	896 1889

2.2 College contacts

The college also provides a number of contact points useful to postgraduate students

- **Graduate Studies Office (GSO):** The GSO administers all M.Sc. and Ph.D programmes in College. www.tcd.ie/Graduate_Studies/ This is also the place where postgraduate students will eventually hand in their theses.
- **Graduate Students Union (GSU):** The GSU is an independent body which represents the graduate students in College: <http://www.tcdgsu.ie/>. Every registered postgraduate student is automatically a full member of the GSU.
- **Postgraduate Advisory Service (PAS):** The PAS offers a comprehensive range of academic, pastoral and professional support, dedicated to enhancing your student experience. E-mail pgsupp@tcd.ie or see http://www.tcd.ie/Senior_Tutor/postgraduate/ for more details.

- **International Office:** The international office provides information and support for international students. E-mail international@tcd.ie or have a look at their web pages <http://www.tcd.ie/international/>.
- **Careers Advisory Service (CAS):** The CAS organizes workshops and various other events, cf. <https://www.tcd.ie/Careers/>

2.3 Admission

Given that research degrees build on individual relationships between research supervisors and students, blind applications to College for admission do not make much sense. Instead, a prospective student should first approach a member of staff with interests in the desired research area, either personally or by email. In case of doubt please contact the DTLP who will try to match your interests to a member of staff and establish the contact. Once a member of staff has agreed in principle to act as supervisor, a research proposal needs to be formulated as part of the formal application for admission. For information on how to submit your formal application please consult the webpages of the Graduate Studies Office http://www.tcd.ie/Graduate_Studies/prospectivestudents/index.php. Once the College receives the application the Graduate Studies Office checks whether the formal admission criteria (at least a 2.1 (or equivalent) in the undergraduate degree and sufficient English language skills) are satisfied. The application is then forwarded to the school and will be returned with a recommendation to either accept or reject the applicant. Whatever the recommendation by the school, the final decision rests with the Dean of Graduate Studies. Please also note that decisions about studentships are usually made in May/June so that late applicants risk not to be considered.

2.4 Start Dates

The official start dates for new research students are either September 1st or March 1st. The majority of students start in September ("September entrants") in line with the academic year structure. The start date subsequently determines the deadlines for the confirmation/transfer procedure (s. below) and of thesis submissions. It should be noted that these dates have shifted by 1 month since the college decided to switch from terms to semesters in 2009/2010. For students who have started prior to this change as October or April entrants, the deadlines are shifted correspondingly.

2.5 Funding

Most students in the School of Mathematics receive some type of funding, which covers their tuition fees (about 6,000 EUR/year) and a student stipend. Current sources of funding are

- EU: the school has been successful in obtaining EU funding for postgraduate students.
- IRCSET scholarships; these pay 24,000 EUR/year for up to 3 years. The stipend is 16,000 EUR/year, the remainder pays for tuition fees, travel and other expenses.
- SFI grants: Science Foundation Ireland funds research projects which come with funding for a postgraduate student for up to 4 years.
- College studentships: cover the tuition fees and a stipend of 8,000 EUR/year for 3 years.
- Ussher studentships: each year two such studentships are awarded to the best candidates from the eight schools within the Faculty of Engineering, Mathematics and Science. The Ussher studentship covers the fees and a stipend of 16,000 EUR/year for 3 years.
- School studentships: The School of Mathematics may award studentships from its own budget.
- Occasionally, international students bring their own scholarship funded e.g. by the government of their home country.

In addition, most students top up their income by teaching tutorials or grading assignments. Students who apply for admission should tick the boxes that they want to be considered for College studentships and Ussher studentships. Note that the timing of the selection (usually in May) means that March entrants are at a disadvantage. Prospective students should watch out for the IRCSET opening of the yearly call in November/December, www.ircset.ie. Deadlines are usually in mid-February, with results announced in April/May. Please note that the application requires to formulate a research project and needs to be endorsed by a potential supervisor so it cannot be left to the last minute.

2.6 College Regulations

Regulations for higher degrees by research are contained in the university calendar part 2, sections 1 and 2. At registration every postgraduate student is given a copy of the university calendar. The university calendar is also available in all College libraries, the school office and online (<http://www.tcd.ie/calendar/>).

Please refer to the University Calendar for general regulations and for information on topics such as:

- Admission requirements
- Probation
- Subject of research
- Role of Director of Teaching and Learning (Postgraduate)
- Progress and continuing registration
- Role of Supervisors
- Attendance
- Part-time registration
- Extension and off-books
- Transfer to/Confirmation on the PhD register
- Procedure for examination of a candidate
- Complaints concerning supervision
- Appeal against the decision of examiners
- Plagiarism

2.7 College policies

- The College subscribes to international standards in research practice. This concerns topics such as ethics and integrity in research. The College policy on good research practice can be found here:

http:
[//www.tcd.ie/about/policies/assets/pdf/TCDGoodResearchPractice.pdf](http://www.tcd.ie/about/policies/assets/pdf/TCDGoodResearchPractice.pdf)

- There is also a policy for best practice in supervision, which both supervisors and students should be aware of:

https://www.tcd.ie/Graduate_Studies/docs/SupervisionGuidelines.pdf

- Dignity and respect policy:

<http://www.tcd.ie/about/policies/respect.php>

2.8 Duration of Studies

The M.Sc. by research takes 1-2 years (full-time), with 2 years being the limit imposed by the University. A Ph.D. should take 3-4 years of (full-time) work, with a limit of 4 years. In exceptional cases a fifth year may be granted, but this is far from automatic: it needs to be justified by the supervisor to the DTLP who then puts a request to the Dean of Graduate Studies who may or may not approve. Students are thus encouraged not to plan for a fifth year. Note that these limits do not apply to students registered part time (cf. calendar part 2 for details), nor to those who interrupt their studies for maternity leave, medical or other reasons. In this case a student can apply for an off the books period during which the clock stops as far as submission deadlines are concerned.

2.9 Extracurricular activities

Life as a postgraduate research student can be stressful and exhausting at the best of times. All students should be encouraged to take part in the various activities on offer in College, be it sports or one of the many student societies. The latter are open to memberships of students (undergraduate and postgraduate) and College staff alike.

<http://www.tcd.ie/Sport/facilities/centre/>

[http://www.tcd.ie/international/student-support-services/
clubs-and-societies/](http://www.tcd.ie/international/student-support-services/clubs-and-societies/)

Chapter 3

Structured Ph.D. programme

In Trinity College Dublin *all* research students are considered part of a structured Ph.D. programme. At the very least the structure is provided by the requirement to submit yearly progress reports to the DTLP and the confirmation/transfer procedure during the second year. As part of their education students are expected to attend public lectures, research seminars and journal clubs organized by the school. Students may also attend taught modules up to a limit of 30 ECTS credits prior to their confirmation/transfer procedure. While in some schools postgraduate students are required to collect a certain number of ECTS credits as a prerequisite for the confirmation/transfer procedure, no such formal requirement exists at present in the School of Mathematics.

3.1 Ph.D. and M.Sc. register

As per college regulations, most research students register on the Ph.D. register, unless they explicitly want to do an M.Sc. degree, in which case they are placed on the M.Sc. register. The initial placement on the Ph.D. register is probational and must be confirmed during the second year by the confirmation procedure. Likewise, students on the M.Sc. register who would like to continue with a Ph.D. undergo the transfer procedure. Both confirmation and transfer procedures have exactly the same format in the School of Mathematics (s. below). Students either on the Ph.D. register or on the M.Sc. register who do not want to continue towards a Ph.D. may submit an M.Sc. thesis instead of going through the confirmation or transfer procedure. Likewise, those who do not pass the confirmation/transfer procedure may either submit an M.Sc. thesis or withdraw from their postgraduate studies.

3.2 Attendance, Seminars

All (full-time) research students are expected to be present in the School during normal working hours. If students are travelling or plan to be absent for more than a week this should be communicated to the supervisor and to the school administrator prior to the absence. If the absence is planned during teaching term the student should make appropriate arrangements regarding his/her teaching duties. Presence at the School allows students to take part in the academic life of the School which is an essential part of their education. In particular:

- all research students are expected to attend all the seminars, colloquia and journal clubs organized by the School of Mathematics which are relevant to their research area;
- students in their 3rd and 4th year are expected to give a presentation either within a seminar/journal club or, in exceptional cases, a colloquium;
- students in their first two years are encouraged to participate in a suitable international summer school. Such activities should be discussed with the supervisor and obviously depends on the availability of funding;
- students in their 2nd, 3rd and 4th years should be enabled to present their research results at an international conference. The details need to be discussed with the supervisor and obviously depend on available funding.
- research students should be aware of further seminars/workshops in the wider Dublin area which may be of interest to them (e.g. at the Dublin Institute of Advanced Studies (DIAS) or University College Dublin).

The school is organising regular weekly or biweekly seminar series and colloquia:

- Dublin Area Theoretical Physics Colloquium (weekly during teaching term)
- Dublin Area Mathematics Colloquium (weekly during teaching term)
- Analysis seminar (weekly during teaching term, alternating between TCD and UCD)
- Computational Applied Mathematics Seminar (biweekly)

In addition there are journal clubs in string theory, lattice field theory and other areas. The postgraduate students are also encouraged to run a series of informal seminars among themselves.

3.3 Taught modules

Within reason students can and should attend taught modules. The details should be discussed with the supervisor, as the research project must remain the priority of the student. Some schools have made the attendance of taught modules a prerequisite for the confirmation or transfer procedure. This is not the case currently in the School of Mathematics. At the moment there are various options available to the research students:

- **taught M.Sc. programme in “High Performance Computing”:** this programme offers a number of taught modules which are of direct relevance to the research in applied mathematics subjects. In particular, research students who work on computational projects are strongly encouraged to attend some of the modules on offer. For details please follow the link:

<http://www.maths.tcd.ie/hpcmsc/>

or contact the current course director, Prof. Mike Peardon (mjp@maths.tcd.ie).

- **undergraduate modules:** some senior sophister modules offered by the school are well-suited for research students, who may not have been exposed to this material during their own undergraduate studies. Interested students should have a look at

<http://www.maths.tcd.ie/undergraduate/modules/ssmaths.php>

While research students are allowed to attend these modules, they would not sit any of the exams, neither for the taught M.Sc. programme nor for the undergraduate modules. Their attendance of a particular module can thus be certified informally by the lecturer, but not in form of an official transcript by the university.

- **taught modules in other schools:** in certain cases, modules offered by other schools may be interesting to research students in the School of Mathematics. This should be discussed with the supervisor and can be arranged informally with the school in question.
- **Innovation Academy:** In collaboration with University College Dublin, Trinity College has set up the Innovation Academy to train postgraduate students in practical skills required for aspiring entrepreneurs. More information here:

http://www.tcd.ie/Graduate_Studies/InnovationAcademy/

- Short courses on specific skills are offered from a variety of institutions. An incomplete list would be

- English language skills for non-native speakers: <http://www.tcd.ie/slscs/postgraduate/english/>
- computer skills: www.tchpc.tce.ie
- generic skills (reading, writing, speaking, teaching etc.): <http://www.tcd.ie/CAPSL/students/>

3.4 Yearly Progress reports

The University requires that at the end of the academic year, each postgraduate research student fills in his/her part of a progress report,

https://www.tcd.ie/Graduate_Studies/currentstudents/admin/progressreports/index.php

and then asks the supervisor to complete the form. The supervisor hands the completed form back to the student who then forwards it to the DTLP. The purpose of the progress report is to monitor the progress of the postgraduate students, so that possible problems can be noticed at an early stage.

3.5 Confirmation/Transfer Procedure

During the second year and within 18 months of registration, the postgraduate students are required to pass a procedure to either confirm them on the Ph.D. register or to transfer from the M.Sc. to the Ph.D register. Only those students who aim for an M.Sc. by research are exempt from this procedure.

The confirmation/transfer procedure consists in

- the submission of a written report of no less than 30 pages in a format similar to the one required for a thesis (cf. calendar part 2). A panel of two experts in the subject area will be nominated to read the report;
- A public presentation of 15 minutes; This is followed by questions from the panel members, i.e. the two experts who have read the report and the DTLP (chair).

The DTLP will set a deadline for the submission of the report, usually for late January/early February. The public presentations will then be scheduled for the end of February, such that the nominated panelists have sufficient time to read the reports.

Possible outcomes of the confirmation/procedure are

- Recommendation to continue on the Ph.D. register;

- Recommendation to continue on the Ph.D. register subject to improvement of the transfer report within the 6 weeks following the decision.
- Recommendation not to continue on the Ph.D. register

In the latter case the candidate may either attempt to obtain an M.Sc. degree, or decide to withdraw from postgraduate studies. The decision of the panel can be appealed though, and in this case an appeals subcommittee will be set up by the executive committee of the school.

3.6 Yearly Progress Talks

Continuing postgraduate Students beyond their 2nd year are required to give a public presentation of 15 minutes about their progress. The format of the progress talks is the same as for the confirmation/transfer procedure and is organized on the same dates, typically late February/early March.

3.7 Thesis Submission

Postgraduate students who plan to submit a thesis are strongly advised to discuss this with their supervisors at an early stage and allow enough time for the supervisor to provide feedback on a draft thesis. While the submission is at the discretion of the student alone, it can be embarrassing not just for the student, if external examiners have to read through a thesis which does not adhere to international publication standards. The student should carefully read through section 1.37 of the College calendar part 2, in order to make sure that all necessary declarations are included and that the format is according to College requirements. Note that the submission of a thesis may have practical consequences for funding: for instance, a College studentship is discontinued after submission of the thesis. Hence in some cases a delay of the submission may be advisable.

3.8 Nomination of examiners

Once a thesis is submitted the Graduate Studies Office (GSO) notifies the DTLP of the school and requests the nomination of both an internal and an external examiner, preferably within 2 weeks. The DTLP in consultation with the supervisor identifies suitable examiners and submits the nomination form to the GSO, together with a 2-page CV and a list of recent (i.e. last 5 years) publications for the external examiner. The same applies for the internal examiner if s/he is not a staff member of Trinity College Dublin. The Dean of Graduate Studies will normally approve the examiners provided

1. the examiners have demonstrated experience in postgraduate research supervision (hence the need for a CV)
2. the examiners are not closely linked to the supervisor or the candidate (e.g. through direct collaboration and common publication during the last 5 years; hence the need for a list of publications).

The approval of the examiners can be decoupled from the submission of the thesis, as it is possible to seek pre-approval of examiners by the Dean of Graduate Studies. This may significantly reduce the time between thesis submission and the examination or viva voce of the thesis.

3.9 Viva Voce

A viva voce is mandatory for Ph.D. candidates. For M.Sc. candidates the School strives to organize a viva voce, too, even though it is not strictly required by the College regulations. In any case, even if a viva voce is not intended the examiners can always request one to be held. The viva voce in the School of Mathematics is organized as follows, for both Ph.D. and M.Sc. candidates:

- The internal examiner is responsible for organisation of the viva voce, in particular for choosing a suitable date and place.
- The viva voce is chaired by the DTLP or his/her nominee.
- The viva begins with a 20 minutes public presentation by the candidate of his/her thesis. At the end of the public presentation the general public may ask questions to the candidate. The public is then asked to leave; only the candidate, the chair and the 2 examiners remain in the room. The supervisor may choose to attend the viva voce as an observer if the candidate agrees. If present, the supervisor may be consulted by the examiners for clarification during the viva voce.
- There is no explicit time limit on the duration of a viva voce. The rôle of the chair is to ensure that the candidate is treated fairly and to clarify College regulations if necessary.
- At the end of the viva voce the candidate is asked to leave the room. The examiners then discuss both the viva voce and the thesis and reach their conclusions. Possible outcomes are
 1. The degree is awarded for the thesis as it stands

2. The degree is awarded subject to minor corrections made to the thesis
 3. The degree is awarded subject to a major revision of the thesis
 4. A lower degree is awarded, possibly subject to minor corrections to the thesis
 5. fail
- The candidate is asked back to the room and informed of the outcome.
 - Both examiners submit their report to the Graduate Studies Office as soon as possible after the viva voce. The Graduate Studies Office then sends a letter of notification to the candidate. If minor corrections are required (this is the most frequent outcome), the candidate has 2 months from the date of notification to implement the corrections. If the internal examiner is satisfied that all corrections have been implemented s/he notifies the Graduate Studies Office that the final version of the thesis can be submitted. in case a major revision is required, the candidate must re-register for a period of up to 6 months (this carries a fee) and the thesis is re-examined by the external examiner after the revision has been carried out.