



Trinity College Dublin

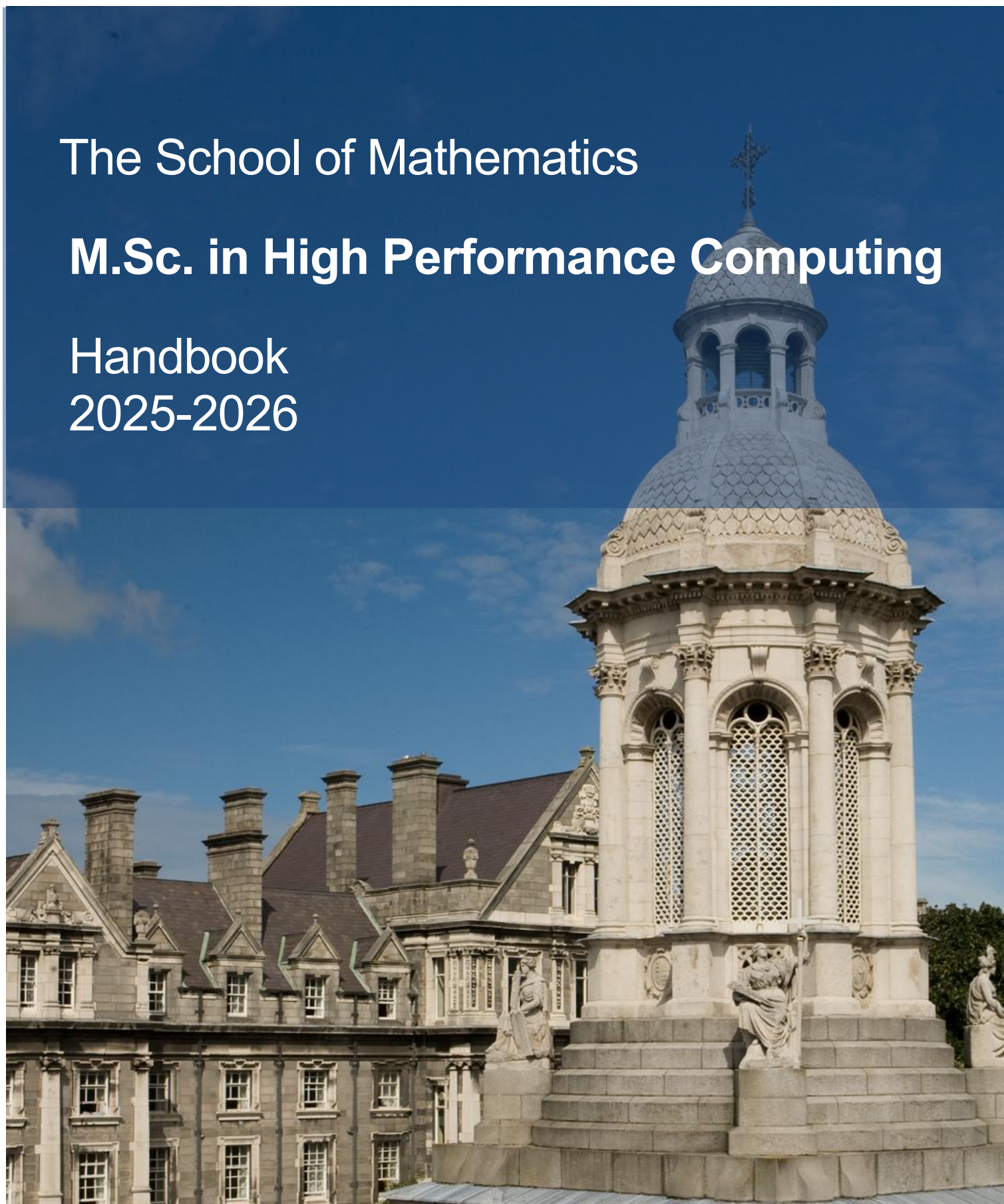
Coláiste na Tríonóide, Baile Átha Cliath

The University of Dublin

The School of Mathematics

M.Sc. in High Performance Computing

Handbook
2025-2026



A note on this Handbook

This handbook applies to MSc High-Performance Computing in the School of Mathematics. It provides a guide to what is expected of you on your programme, and the academic and personal supports available to you. Please review it carefully and retain it for future reference.

The handbook is intended to complement the regulations and information found in the Calendar (Part III) which governs all academic activity in Trinity College Dublin, the University of Dublin. Please familiarise yourself with both the Trinity College Dublin Calendar and this handbook, so that you are fully aware of all the information relevant to you and the rules and regulations that apply to your programme of study. The Trinity College Dublin Calendar may be consulted in the Berkeley library or at the following link: www.tcd.ie/calendar.

The information provided in this handbook is accurate at time of preparation. Any necessary revisions will be notified to students via your Programme Blackboard page. Please note that, in the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in this handbook, the provision of the General Regulations in the Calendar will prevail.

For queries related to student services and general college administration, the School of Mathematics Postgraduate Handbook should be ones first resource.

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1 Contact Information & Key Dates

1.1 Contact Information

Programme Director

Professor Patrick Fritzsche

Email: msc_hpc@maths.tcd.ie

Location: Lloyd Institute, 2.19

Course Office

Email: mathdep@maths.tcd.ie

Location: 0.6, School of Mathematics, 18 Westland Row

School Office Opening Hours

School Office Opening Hours

The School Office is located on the ground floor in room 0.6 of the School of Mathematics.

Monday	08:00 - 16:30
Tuesday	08:00 - 16:30
Wednesday	08:00 - 16:00
Thursday	08:00 - 16:30
Friday	08:00 - 16:00



Key Dates

Date	Event
August - September	Visit Academic Registry
	(Registration / Collect student ID, etc)
September	Welcome session with Programme Director
15/09/25	Semester 1 classes commence
15/12/25	Semester 1 examinations commence
24/12/25-1/01/26	Christmas Period (College closed)
19/01/26	Semester 2 classes commence
17/02/26	Semester 1 provisional results released (TBC)
20/04/26	Semester 2 examinations commence
24/08/26	Semester 1 & 2 supplemental examinations commence
~09/09/26 (TBC)	Semester 1 & 2 supplemental results released
	Deadline for dissertation submission
	Final official results published
	Graduation Ceremony (TBC)

2 General Information

Emergency Procedure

In the event of an emergency, dial Security Services on extension 1999 Security Services provide a 24-hour service to the college community, 365 days a year. They are the liaison to the Fire, Garda and Ambulance services and all staff and students are advised to always telephone extension 1999 (+353 1 896 1999) in case of an emergency. Should you require any emergency or rescue services on campus, you must contact Security Services. This includes chemical spills, personal injury or first aid assistance. It is recommended that all students save at least one emergency contact in their phone under ICE (In Case of Emergency).

Health and Safety

Further information on student health and safety is available at <https://www.tcd.ie/stem/undergraduate/health-safety.php>, including the Faculty Health and Safety Guidance Manual.

This statement supplements the Trinity College Safety Statement and College Policies which are accessible on the web at:
<https://www.tcd.ie/estatesandfacilities/security/>

Data protection

Trinity College Dublin uses personal data relating to students for a variety of purposes. The University is careful to comply with its obligations under data protection laws and has prepared a guide to ensure you understand how student data is obtained, used and disclosed in the course of performing University functions and services. Information on Data Protection for Student Data is available at the following link: <https://www.tcd.ie/dataprotection/>

3 School Information

3.1 General School Information

The School of Mathematics can be found in a combined building of Houses 17 - 20 in the Hamilton Building, at the eastern end of Trinity Main Campus. The closest pedestrian and vehicular entrance are via Lincoln Gate, with Pearse Street pedestrian entrance also located close to the Hamilton Building. Access to the School can be gained on the ground floor through House 17 and 20 and on the first floor through House 17, 19, and 20.

3.2 School Management

A complete list of School of Mathematics staff with roles is available at www.maths.tcd.ie/people.

Responsibility for the management of the School of Mathematics (see link above) rests with the Head of School. The Head of School is responsible for the effective general management of the School, for ensuring the provision of academic leadership and vision, and for the quality of the student experience.

The School Executive Committee is the key decision-making body of the School and comprises of the Head of School (Chair), Director of Teaching and Learning (Postgraduate), Director of Teaching and Learning (Undergraduate), Director of Research, Head of Discipline (AMTP), Head of Discipline (Pure Mathematics), Director of Global Relations and a student representative (generally, this is the School of Mathematics convenor or a student nomination from the convenor to attend on their behalf).

School Opening Hours

The School of Mathematics is open:	Weekdays	08:00 - 18:00
	Weekends	Swipe access only

4 Programme Overview

Programme Structure

The Masters in High-Performance Computing takes place over a full academic year, defined by two semesters (Michaelmas and Hilary term). These are followed by a period of time allocation for the completion of individual dissertations and relative seminars during Trinity Term.

Students must take a range of taught modules that total 90 ECTS in value. This usually consists of 12 x 5 ECTS modules, including compulsory and optional subjects. Please be aware that the number and value of modules may be adjusted to meet the needs of the Programme. In addition, students must undertake a dissertation/research-based project on a topic and in a manner approved by the Course Director.

The European Credit Transfer System (ECTS)

The European Credit Transfer and Accumulation System (ECTS) is an academic credit system based on the estimated student workload required to achieve the objectives of a module or programme of study. It is designed to enable academic recognition for periods of study, to facilitate student mobility and credit accumulation and transfer. The ECTS is the recommended credit system for higher education in Ireland and across the European Higher Education Area.

The ECTS weighting for a module is a measure of the student input or workload required for that module, based on factors such as the number of contact hours, the number and length of written or verbally presented assessment exercises, class preparation and private study time, laboratory classes, examinations and professional training placements. There is no intrinsic relationship between the credit volume of a module and its level of difficulty.

Trinity College Dublin norm for full-time study over one academic year at masters' level is 90 credits (inclusive of the Masters research dissertation normally of 30 ECTS weight).

1 credit represents 20-25 hours estimated student input, so a 10-credit module will be designed to require 200-250 hours of student input including class contact time, assessments and examinations. ECTS credits are awarded to a student only upon successful completion of the programme year.

Each taught module on the MSc programme is equivalent to 5 or 10 ECTS credits and comprises approximately 18 hours of class contact time, representing an overall student effort of 100-125 hours.

Modules for each programme are listed on the Programme Blackboard site. Outlines for each module will be posted on Blackboard. Please note that optional modules are offered subject to sufficient student demand and availability. The Programme Committees reserve the right to alter the sequence of modules for operational and/or academic reasons. Such changes will be notified as soon as feasible to students.

The School reserves the right to amend the list of available modules and, in particular to withdraw and add modules. Timetabling may restrict the availability of modules to individual students.

Where applicable, students are required to notify the Programme Administrator of their module choices for Semester 1 and 2 by mid-September. Student who does not submit their module choices by these deadlines will be automatically assigned to modules by the Programme Director. Module changes after the above deadlines are not possible unless exceptional circumstances (e.g. medical reasons) exist. In such exceptional circumstances, the request for a change of module choice must be submitted in writing to the Programme Director, together with any supporting documentation relevant to the request.

Programme Modules

FIRST SEMESTER

MODULE	ECTS	LECTURER
MAP55611 HIGH-PERFORMANCE COMPUTING SOFTWARE I	5	DARACH GOLDEN
MAP55613 C PROGRAMMING	5	RICHIE MORRIN
MAP55621 HIGH-PERFORMANCE COMPUTING HARDWARE AND ARCHITECTURE	5	PATRICK FRITZSCH
MAP55631 NUMERICAL METHODS	5	KIRK SOODHALTER
MAP55600 TOOLS FOR SCIENTIFIC AND TECHNICAL COMPUTING	5	JUAN ANDRÉS URREA NIÑO
MAP55640 SEMINAR SERIES	5	PATRICK FRITZSCH , KIRK SOODHALTER

SECOND SEMESTER

MODULE	ECTS	LECTURER
MAP55612 HIGH-PERFORMANCE COMPUTING SOFTWARE II	5	DARACH GOLDEN
MAP55614 C++ PROGRAMMING	5	RICHIE MORRIN
MAP55672 CASE STUDIES IN HIGH-PERFORMANCE COMPUTING	5	KIRK SOODHALTER
MAP55600 TOOLS FOR SCIENTIFIC AND TECHNICAL COMPUTING	5	JUAN ANDRÉS URREA NIÑO
MAP55640 SEMINAR SERIES	5	PATRICK FRITZSCH , KIRK SOODHALTER

SUMMER M.SC. PROJECT

MODULE	ECTS	SUPERVISOR
MAP55690 HIGH-PERFORMANCE COMPUTING PROJECT	30	VARIOUS

Elective Modules

Students should select 15 ECTS credits from the following modules:

FIRST SEMESTER

MODULE	ECTS	LECTURER
MAP50005 QUANTUM LATTICE FIELD THEORY	5	STEFAN SINT
(EXTERNAL) PG MODULES *		

SECOND SEMESTER

MODULE	ECTS	LECTURER
MAP55616 GPU PROGRAMMING WITH CUDA	5	JOSE REFOJO
MAP55632 FINANCIAL APPLICATIONS (PREREQUISITE MAP55633)	5	DARACH GOLDEN
MAU34210 PARTIAL DIFFERENTIAL EQUATIONS	5	NICHOLAS AIDOO
(EXTERNAL) PG MODULES *		

4.5 Programme Requirements

The course is aimed at graduates with a degree in a technical discipline such as mathematics, physics, engineering, chemistry or mathematical finance. No prior programming experience is assumed but some familiarity with the concepts is useful. A background in basic mathematical concepts is also important.

4.6 FAQ

Electives

When is my selection of elective modules due?

At the beginning of the academic year you should inform the [M.Sc. course coordinator](#) about your preferred choices for elective modules for semester 1 and 2. This must be finished within week 1.

How many elective modules do I have to choose?

You have to choose *at least 3 elective modules (5 ECTS each)* distributed across 2 semesters. A semester without elective module is not permitted.

Which (external) elective modules are admissible?

You can choose (external) elective modules from the School of Computer Science and Statistics ([SCSS](#)) and School of Physics ([SoP](#)) post-graduate programmes if their content is sufficiently close to High-performance Computing.

Shall I contact the elective module lecturer to register?

No. After collecting all M.Sc. in High Performance Computing students choices for elective modules, we contact the corresponding school to enlist you to those modules.

Is a place in an admissible elective module guaranteed?

Not necessarily. We can only guarantee a place in modules hosted by the School of Mathematics whereas places in external modules (hosted by other Schools) are subject to availability.

Can I switch modules after being registered?

No. Being registered for an elective module is serious and you have to complete it as any other module.

What if I am interested in attending additional modules?

In principle, you are allowed to listen to other modules, i.e., without participating in examinations (coursework or exam). However, first and foremost you should focus on your M.Sc. in High Performance Computing modules, all of which are strictly relevant for your final grade.

General

What is the preferred communication channel at TCD?

Trinity college's preferred communication is by e-mail. As a M.Sc. student in High Performance Computing you obtain a TCD mail account and will receive all notifications to that account. Please check your TCD e-mail on a regular basis to not miss important announcements or deadlines, from College, your school or your lecturers.

Is there a module webpage with detailed resources accompanying the lectures?

TCD provides central access to all its modules through a service called [Blackboard](#). You can login with your TCD account and will have access to the modules you are registered for. However, each lecturer decides how to use that service and what kind of information is provided. If necessary, contact your lecturer for details.

You cannot find the relevant question in this FAQ section?

Contact your [M.Sc. course coordinator](#).

5 Assessment & Progression

To be eligible for the M.Sc. award, students must, within the period of registration, pass a prescribed set of taught modules of 60 ECTS and satisfactorily complete a dissertation of 30 ECTS. Students who do not wish or are unable to complete a Dissertation may apply for a Postgraduate Diploma in **High Performance Computing** exit award. Such students must have an overall average mark of at least 50%, have passed taught modules amounting to at least 50 credits (50 ECTS) and achieved a minimum mark of 40% in any failed modules. To voluntarily avail of this option, students must inform the Course Director in writing within four weeks of the date on which the interim results of the last regular module results for the academic year are communicated to students.

Taught Modules

The taught modules will be assessed through a combination of formal written examination, graded continuous assessment assignments, class presentations and reports. To pass a taught module, students must satisfactorily complete any associated work for that module, and obtain a pass mark of at least 50% in each assessment components of the module. Students are allowed to sit repeat examinations and take repeat assignments in taught modules accounting for no more than 10 credits (10 ECTS) over the course of the registration period and remain eligible for consideration for the award of the M.Sc. Degree.

A student may fail modules amounting up to 10 credits and pass the taught component of the program by compensation provided they have an overall average mark for the taught modules of at least 50%, pass core (mandatory) and optional modules amounting to at least 50 credits (50 ECTS) and achieve a minimum of 40% in any failed modules. Students who fail taught modules accounting for more than 10 credits (10 ECTS) overall will be required to withdraw from the program. Similarly, any student who fails to pass, by compensation or otherwise, a repeat examination/assignment will be required to withdraw from the program.

Dissertation

To pass the Dissertation module, students must submit their dissertation by the prescribed date and must obtain an overall weighted average mark of 50% for the assessed elements as specified in the Dissertation marking regulations. The M.Sc. dissertation will be submitted and examined in line with the General Regulations for Taught Graduate Courses stated in Part B (Section 3: Examination of Dissertation) of the University of Dublin Calendar part 3 for Graduate Studies and Higher Degrees for a given year.

Students who fail one or more modules are allowed to work on a dissertation project while preparing for the supplemental assessment. Note that as mentioned above, students can take supplemental examinations in the failed modules (excluding the dissertation). The total mark for such failed modules is then determined by their examination mark (i.e. the supplemental exam counts for 100% of the total mark of the module). Only one supplemental examination attempt is allowed for each module.

Marks and distinction

The School publishes interim examination results after each set of examinations. Final determination of results is on foot of a final Court of Examiners with the external examiner present. As part of the Court of Examiners the external examiner monitors assessment processes and moderates all module marks.

The final degree mark is based on a credit-weighted average of the marks awarded in each module. The M.Sc. with distinction may be awarded to students who pass all taught modules and achieve at least 70% both in the overall mark for the course and in the dissertation if they have not repeated any examinations that form part of their module results.

Students who fail the Dissertation will not be eligible for the award of the M.Sc. but will be eligible for the award of a Postgraduate Diploma, provided they have successfully completed 60 ECTS of taught modules.