

# GRADUATE STUDENT HANDBOOK, 2023-24

Department of Physics and Atmospheric Science

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The Graduate Student Handbook of the Department of Physics and Atmospheric Science is a guide to the formal framework of our MSc and PhD programs. This framework was designed to foster an environment wherein students can successfully complete their degrees. Some of the regulations described in this Handbook originate in the Department, whereas others are from the Faculty of Graduate Studies (FGS), and are documented in the [Graduate Calendar](#) and [FGS's Web site](#). In the case of discrepancies between this Handbook and Graduate Calendar, the Graduate Calendar has precedence.

Corrections should be sent to the Graduate Coordinator, Prof. Thomas J. Duck <[tduck@dal.ca](mailto:tduck@dal.ca)>.

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## 1. General program information and procedures

### 1.1 Registration

Graduate students must maintain their registration in all three terms (Fall, Winter, Summer) until their program is completed, except in those cases where a formal Leave of Absence has been granted by the Faculty of Graduate Studies (FGS). The deadline for Fall registration is usually at the beginning of August. If a student anticipates continuing for an entire year, then it is usually most convenient to register in August for the entire year.

Instructions on how to register for courses are given on FGS's [Current Students](#) page. Course registration numbers (CRNs) are given in the [Academic Timetable](#).

In addition to subject courses, students must register for the following. Note that there is a distinction between students in Physics & Atmospheric Science and Medical Physics.

**Each term**, all students must register for the Fee Generating Course, REGN 9999.

**Each term**, all students must register for the course associated with their thesis:

- PHYC 9000 for MSc Physics and Atmospheric Science;
- MEDP 9000 for MSc Medical Physics;
- PHYC 9530 for PhD Physics and Atmospheric Science; or
- MEDP 9530 for PhD Medical Physics.

Failure to register for both REGN 9999 and PHYC/MEDP 9XXX each term will lead to a stop in pay, including non-payment of scholarships and stipends.

**In both Fall and Winters terms**, registering in the following seminar courses is required:

- PHYC6801 for all MSc students in Physics and Atmospheric Science;
- PHYC6802 for all PhD students Physics and Atmospheric Science; or
- MEPD 6416 for all first-year Medical Physics students.

**Each term**, until it is passed, PhD students must register for the course associated with their comprehensive/preliminary exam:

- PHYC 9520 for Physics or Atmospheric Science; or
- MEDP 9520 for Medical Physics.

### 1.2 Supervisory Committees

Supervisory Committees ordinarily consist of the supervisor(s) plus two additional members. Each member must be either a faculty member or an adjunct faculty member at Dalhousie University. The composition of the Supervisory Committee is specified on the Program Requirements form described below. The supervisor chooses the

composition of the Supervisory Committee in consultation with the Graduate Coordinator. More information on regulations for committee membership can be found in [Section IX](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

### **1.3 Program Requirements Form and Course Selection**

In the first month of study, a student should consult with their supervisor to determine their program requirements. The following should be emailed to the Graduate Secretary: a) a list of classes required to complete the program; and b) the names of the faculty members who will serve on the Supervisory Committee. The Graduate Secretary will enter this information into the Program Requirements form of the [Graduate Studies Information System](#) (GSIS). GSIS is the component of Dal Online that keeps track of a student's graduate program, from admission through to convocation.

Once the form is entered on GSIS, notices will be sent by e-mail to obtain electronic signatures. The form is digitally signed first by the student, then by the supervisor, the Graduate Coordinator, and finally FGS.

The Program Requirements form constitutes an agreement between the student and the university on the requirements to complete the program. Before graduation, FGS will review a student's form to ensure that all requirements are met. The student will not be permitted to graduate if there are any deficiencies. It is the responsibility of the student to ensure the information in the Program Requirements form is accurate.

Students should only take classes listed on their Program Requirements form. If they take additional classes, then they may be required to pay additional fees.

#### ***1.3.1 Reading courses***

Student may not take more than 2 courses of independent study, directed readings or special topics courses (combined) per degree (see [Section VII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#)).

#### ***1.3.2 Courses taken outside Dalhousie University***

If a course is not offered at Dalhousie, then it can be taken at other Universities as part of the degree requirements once approved by the Graduate Coordinator and FGS. No more than 33% of a student's courses may be taken outside of Dalhousie. To take a course outside Dalhousie, an equivalent Dalhousie course number (or a 'Topics' course number, e.g. PHYC 6601 Topics in Physics) must be identified, and a Letter of Permission Request form (see FGS's [Forms and Documents](#) page) must be submitted to the Graduate Secretary.

Dalhousie will normally pay the tuition for students to take courses offered at other Maritime universities, to the equivalent cost of a Dalhousie course (see [Section VII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#)).

### 1.4 Program Changes

The supervisor and Graduate Coordinator must approve any change to a student's Program Requirements form. These changes include, but are not limited to, transfer from MSc to PhD (or vice versa), a change from full-time to part-time status (MSc students only), a change in course requirements (including course audits), and a change in the Supervisory Committee. FGS must be notified of changes through a Graduate Student Program Update form (see FGS's [Forms and Documents](#) page).

A hard copy of the form is filled out by the student and returned to the Graduate Secretary. The student is responsible for getting their supervisor's signature. The student will be notified by e-mail when the form is ready to be electronically signed on GSIS. The forms will then be digitally signed by the supervisor, the Graduate Coordinator, and finally FGS.

Program changes come into effect at the beginning of the term. FGS requests that Program Update forms not be submitted more than two months ahead of the term start.

### 1.5 Leave of Absence

A leave of absence must be approved by FGS. The request is made through Leave of Absence Request form (see FGS's [Forms and Documents](#) page).

The request must be submitted prior to the term in which it is to take effect. International students must consult with an international student advisor prior to submitting this form. The student submits the form to the Graduate Secretary after obtaining the supervisor's signature.

### 1.6 Transfer from MSc to PhD

MSc students may transfer into the PhD program by submitting a Graduate Student Program Update form (see FGS's [Forms and Documents](#) page). Transfers from MSc to PhD must be submitted well in advance of the beginning of the term in which the transfer is to take place. Once the change takes effect, students are considered to have retroactively been a member of their new program, from the start of their registration in the previous program. Students are required to complete a new Program Requirements form within the first month of when the change takes place.

A transfer from the MSc to PhD program must have the agreement of the supervisor and Supervisory Committee. Students switching from the MSc to PhD are ordinarily required to have maintained an average of A- or higher during their MSc courses.

### 1.7 Progress Reports

FGS requires students to submit an annual progress report, one month in advance of the anniversary of their admission into the program. If, however, the student is in an MSc program and has already submitted their thesis to the examination committee (or submission is imminent), it is not necessary to submit a Progress Report. This exemption does not apply to scholarship students.

Students holding external or Killam Scholarships are required to submit an Annual Progress Report one month in advance of their award date, starting in their first year. Failure to submit a Progress Report will result in withholding of funding.

Students fill out their progress report on [GSIS](#). Once a report is submitted, further input is obtained electronically from the supervisor, Graduate Coordinator, and FGS.

### 1.8 Financial Assistance

Scholarship support is provided directly to some students by the Natural Sciences and Engineering Research Council, the Killam Foundation through Dalhousie, by companies, and by other agencies. Students are encouraged to apply for external support whenever possible. See FGS's [Scholarships and Bursaries](#) page for detailed information on what is available. A summary is given below.

Students without external scholarship support are generally awarded Dalhousie Graduate Fellowships from funds that come to the Department from the University and from individual faculty member's research grants. Students often receive additional financial support from Teaching Assistantships.

To maintain full-time status and continued scholarship/fellowship support, a student may be employed no more than 16 hours per week, including a maximum of 10 hours as a teaching assistant/marker/demonstrator. Students registered as part-time are not eligible for scholarship or Dalhousie Graduate Student Fellowship support.

Departmental funding is normally provided for two years to an MSc student and four years to a PhD student.

Highly qualified students are encouraged to apply for Killam scholarships in January. Applications are first submitted to the Department, which then submits nominations to FGS. Canadian Citizens may apply for Killam scholarships only if they have applied for NSERC support in the previous Fall. Killam scholarships can be awarded to incoming students in both MSc and PhD programs; however, currently registered students may apply for Killam scholarships only if they are enrolled in a PhD program, or if they have been accepted to a PhD program at Dalhousie University.

Sumner Awards are in the amount of \$6,000. Students are eligible if they (1) are enrolled in a PhD program, (2) are Canadian citizens, (3) and if they hold a degree from a Canadian University other than Dalhousie. Preference is given to those with ties to Nova Scotia or the Maritimes, and to those who received an award in the previous year. The awards are for one year, but students may receive the award for up to two years. The application deadline is during the Winter term.

Nova Scotia Graduate Scholarships (NSGS) are available for MSc and PhD students. Students may not be enrolled in the graduate program they would hold the scholarship in at the time of application. PhD scholarships are valued at \$15,000 for domestic students and \$10,000 for international students. Department deadlines are mid-November for students starting in May

or September, and end of January for students starting in September. Students planning on transferring from an MSc to a PhD program must apply for the Doctoral scholarship before they begin the Doctoral program.

Students typically receive a funding letter from FGS and a tuition statement from the Registrar's Office during the summer stating their total rate of pay for the upcoming academic year. Students are encouraged to discuss this letter with their supervisor if there is anything about the letter that they do not understand. They are also encouraged to monitor their subsequent paycheques to ensure consistency with their funding letter as mistakes can occur due to the complexity of the calculation of the amount of the stipend.

### 1.9 FGS Travel Support

Students are encouraged to apply to FGS for travel support to attend scholarly meetings and conferences where they are presenting a poster or paper based on the results of their graduate thesis. Students are eligible for one travel grant during their graduate degree program. Applications must be submitted at least one month prior to travel. Further information and the application form are available on the [FGS Travel Grant](#) page.

The University requires claims to be submitted within 30 days of completion of travel. Travel claims should be accompanied by original receipts. Failure to complete a travel claim within the time specified may result in required pay-back of any FGS Travel Grant Funds. Travel claims are submitted using [Chrome River](#).

### 1.10 Time Management

It is generally expected that students will spend 40 hours per week on their research, classes, and TA responsibilities. When classes are in session, students should allocate on average one (8 hour) day per week for a full TA, and approximately one day for each class they are taking, with the remainder being spent on research.

### 1.11 Vacation

Students are entitled to two weeks of vacation per year, or another (greater) amount negotiated with their supervisor, not including days in which Dalhousie University is closed (see Dalhousie's calendar of [Important Dates](#)).

### 1.12 Responsibilities and Rights of Students and Supervisors

The rights and responsibilities of students, supervisors, and the Department are outlined in [Section IX](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#), and are reproduced below.

#### ***Responsibilities of Supervisors***

When faculty members accept the supervision of graduate students, they assume several responsibilities:

- to provide reasonable access to their student(s) and to be available for consultation at relatively short notice;
- to be as helpful as possible in suggesting research topics and in assisting students to define their theses;

- to tell students approximately how long it will be before written work, such as drafts of chapters, can be returned with comments;
- to be thorough in their examination of thesis chapters, supplying, where appropriate, detailed comments on such matters as literary form, structure, use of evidence, relation of the thesis to published work on the subject, footnoting, and bibliographical techniques, and making constructive suggestions for rewriting and improving the draft;
- to indicate clearly when a draft is in a satisfactory final form or, if it is clear to the supervisor that the thesis cannot be successfully completed, to advise the student accordingly;
- to know the academic unit and University regulations and standards to which the writer of a thesis is required to conform, and to make sure that the student is aware of them;
- to continue supervision when on leave, possibly with arrangements also being made for members of the supervisory committee to assist the student for the leave period;
- to advise and help the student to approach other faculty members for assistance with specific problems or even to request the reading of a chapter or section of the thesis;
- to see that all ethics and animal care approvals, as appropriate, are secured.

### ***Responsibilities of Students***

When graduate students undertake the writing of a thesis, they assume several responsibilities:

- to choose a topic (with the supervisor's aid and advice) and to produce a thesis that is essentially their own work;
- to produce a thesis that meets the standards of scholarship required by the University and the academic unit, including demonstration of their capacity for independent scholarship and research in their field;
- to acknowledge direct assistance or borrowed material from other scholars or researchers;
- to realize that the supervisor has undergraduate or other duties which may at times delay the student's access to the supervisor;
- to give serious and considered attention to advice and direction from the supervisor;
- to submit their work to the judgment of the academic unit and to abide by its decision when any rights of appeal, if exercised, have been exhausted;
- to know the academic unit and University regulations and standards to which the writer of a thesis is required to conform;
- to comply with all ethics and animal care requirements.

### ***Rights of Supervisors***

Supervisors have the following rights:

- to expect students to give serious and considered attention to their advice concerning what they regard as essential changes in the research and thesis;
- to terminate supervision and advise the student to find another supervisor where evidence shows the student does not heed advice and ignores recommendations for changes in the research and thesis, or if the student is not putting forth a reasonable effort;
- to have their thesis supervision properly credited by the academic unit as an intrinsic part of their workload so that, in the assignment of duties, they are not overburdened to the point of having their effectiveness impaired as supervisors;
- to have the student acknowledge, by footnoting, all portions of the supervisor's own research over which the supervisor wants to retain future rights of authorship;
- to retain the right to use the results of research carried out under their supervision for the benefit of a larger project — this is always with the understanding that students will retain scholarly credit for their own work and be given acknowledgment of their contribution to the larger project.



## ***Rights of Students***

Students have the following rights:

- to have a clear understanding of what is expected in thesis writing (expected length, acceptable methodology, validity of topic, notification of progress);
- to expect help from their supervisor in establishing a feasible topic, in solving problems and assessing progress as the thesis is being written;
- to receive a fair assessment of the completed thesis and explanations of negative criticism;
- to be allowed to have a new supervisor when they can offer convincing reasons to the academic unit for the change and the change can be reasonably accommodated by the academic unit;
- to be protected from exploitation by their supervisor or other faculty members if the latter should:
  - a) intrude upon the student's right of authorship or fail to give a student authorship credit for team research (where applicable, the academic unit's protocols on authorship should be provided to students before they embark on research), or
  - b) divert the student's efforts from the timely completion of the thesis;
- to submit a thesis even if the supervisor is not satisfied, although such action should be taken only in extreme cases and after full consultation with the academic unit.

### **1.13 Appeals**

A student has the right to appeal grades and other evaluations of their performance that occur during their program. In accordance with FGS policy, the grounds for appeal are limited to the following (see [Section XII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#)):

1. Procedural unfairness,
2. Bias, or irregularity in procedure.

The procedure a student must follow in an appeal is as follows:

1. The appeal must first be made to the instructor or Faculty member responsible for the outcome in question.
2. If the student is unsatisfied with the outcome of the first appeal, the student may then submit an appeal in writing with supporting evidence to the Graduate Coordinator. The submission must give specific details to support the grounds for the appeal and when they occurred. The appeal must be received either within 30 days of the event or circumstance being appealed, or within 30 days of receipt of the outcome that is being appealed. The written appeal will be reviewed by the Graduate Advisory Committee, which will provide a written response to the appeal within 10 working days. A copy of the appeal and the response will be given to the Chair of the Department.
3. The student may appeal the outcome given by the Graduate Advisory Committee by writing to the chair. The chair may request a meeting with the student, together with the Faculty member or instructor whose decision is being appealed, and the Graduate Coordinator. The outcome of the appeal will be given in writing within 10 working days of receipt of the appeal to the Chair of the Department.

4. The student may appeal the Department's decision by submitting a written appeal to Faculty of Graduate Studies, as outlined in [Section XII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

### 1.14 Conflict Resolution

Problems are easier to manage if they are addressed early, and in a timely. It is important to make written notes of any incident(s), including the date and time of the occurrence so that facts can be clearly articulated in event of a formal appeal.

The following are the recommended steps toward resolving a conflict:

1. Speak directly with your thesis supervisor (if the problem is related to supervision) or course instructor (if the problem is related to a course). Remember: It's more effective to discuss issues in person rather than trying to solve problems via email. Be specific, not personal, and focus on facts.

If this does not resolve the problem or if the student is too uncomfortable to choose this action (i.e., the issue is related directly to the student-supervisor relationship), then the student should:

2. Discuss the problem with the Graduate Coordinator. The Graduate Coordinator will give advice on how to proceed. Under some circumstances, if the student desires, the Graduate Coordinator might speak to the professor on the student's behalf.

If this does not resolve the problem, then:

3. The Graduate Coordinator will bring the issue to the Department Chair.

In the unlikely event that an issue cannot be settled internally with the collaborative efforts of our Department members through discussions with the supervisor, Graduate Coordinator, and Department Chair, then the student should contact FGS.

### 1.15 Extensions

The normal upper time limits for an MSc are four years for full time students, and five years for part-time students. The time limit for a PhD student is six years. Students anticipating exceeding these limits should consult [Section VII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

### 1.16 Academic Integrity

It is of vital importance that students properly cite the work of others that they use and/or describe in their thesis and other writing. Failure to do so is considered plagiarism and is treated very seriously by the University. All students are expected to familiarize themselves with the [University Regulations](#) on [Intellectual Honesty](#) in the [Graduate Calendar](#).

## 2. Program Requirements

### 2.1 Course requirements

The course requirements for Physics & Atmospheric Science and Medical Physics are described in separate subsections below.

The passing grade for any course is B- (see [Section VII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#)). If a student obtains a grade less than B-, then this is recorded as an F (Fail) and he/she will be withdrawn from the Graduate Program and must apply to the Department for reinstatement. Reinstatement is at the discretion of the Department and Faculty of Graduate Studies, following input from the Supervisory Committee. If a student fails two courses, re-admission is at the discretion of the Faculty of Graduate Studies and is highly unlikely.

#### 2.1.1 Physics and Atmospheric Science

Courses are expected to be relevant to a student's research. They do not have to be offered by the Department of Physics and Atmospheric Science. A [list of graduate courses](#) is given on the [Departmental website](#).

MSc students are normally required to complete four 3-credit hour courses (i.e., four regular one-semester courses) at the 5000 level or higher, plus the seminar course. The PhD program normally requires a minimum of three 3-credit hour courses, plus the seminar course. The Supervisory Committee has the right to require additional courses, beyond the minimum, depending on the student's background. PhD students are expected to complete a total of seven 3-credit hour graduate courses beyond their undergraduate degree, including those from their MSc, plus the seminar course. Additional courses taken during an MSc cannot be counted toward the minimum requirement for the PhD without approval from FGS at the start of the student's program.

#### 2.1.2 Medical Physics

The Medical Physics graduate program is accredited by the Commission on Accreditation of Medical Physics Educational Programs ([CAMPEP](#)). The MSc is strictly a two-year program, while the PhD program is normally four years. The Medical Physics curriculum requirements are set to satisfy the CAMPEP standards and consist of nine core courses to be completed in the first year of the MSc or PhD. The Supervisory Committee may require a PhD student to take additional courses beyond the nine core Medical Physics courses. A [list of the core courses](#) is available on the [Departmental website](#).

Medical Physics students should register for the nine MEDP courses, and not the cross-listed PHYC equivalents.

### 2.1.3 Medical Physics Certificate Program

The Medical Physics Certificate Program is CAMPEP certified and is available to students who hold a PhD in Physics. It is designed for students who wish to qualify for admission to a Medical Physics residency training program. The Certificate Program is one year in duration and consists of the nine core courses that are part of the Medical Physics MSc and PhD programs.

## 2.2 Seminars

Students are required to attend Departmental colloquia, and to attend the Departmental seminar series most relevant to their area of research. Students who are unable to attend seminars regularly must have the specific agreement of their Supervisory Committee that this requirement be waived. Material presented in the seminars may form part of the questions addressed to the candidate during the PhD preliminary/comprehensive exam.

Every graduate student is required to give at least one talk per year in one of the Department's regular graduate seminars series, although the specific requirements vary between Physics, Atmospheric Science, and Medical Physics. This is a good opportunity to give a talk in an informal environment. All graduate students are also required to attend their division's graduate seminars.

## 2.3 Supervisory Committee Meetings

It is the responsibility of the student to arrange initial and regular meetings with the Supervisory Committee. The purpose of the Committee is to provide advice and guidance to the student. Students should consult with the members of their committee to select dates and times for each meeting. The student should book a room for the meeting, and, if necessary, a laptop and data projector from the Physics Office.

At least one week prior to each meeting the student should fill out the first page of the Thesis Advisory Committee Meeting Report form (obtained from the Graduate Secretary) and distribute it to all Committee members together with their curriculum vitae (CV). The student should bring the Thesis Advisory Committee Meeting Report form to the meeting for the Committee to complete.

Supervisory Committees should meet at least twice per year during the thesis research period and more often in the writing stages of a student's program. The first meeting should occur during a student's first semester to discuss expectations for their program. For PhD students, the second meeting should discuss expectations for their preliminary/comprehensive examination. Subsequent meetings will focus on progress of the student's research.

Students should be prepared during committee meetings to answer questions on the board. For virtual meetings, preparations must be made to share hand-written answers to questions. One approach is to use a smartphone as a document camera to capture answers with a pen and paper (see image on right).



Smartphone screens may be mirrored to a laptop or desktop, and then shared in the video conferencing software.

Instructions for how to mirror a smartphone screen can be found on [YouTube](#).

## 2.4 Doctoral Preliminary/Comprehensive Exam

The Department of Physics and Atmospheric Science has a combined preliminary/comprehensive exam in which the candidate is asked to defend their research and is orally examined on subjects relevant to the general area of their research.

Preliminary/comprehensive exams are discussed in [Section VIII](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

The candidate should prepare a proposal of about 20 pages. This proposal should be distributed to the Supervisory Committee and Graduate Coordinator (or designate) at least one week before the examination. The proposal should include an abstract, literature survey, statement of proposed research objectives, current results, work plan, and timeline.

The candidate should book the room and projector for the meeting. The candidate should also bring a Thesis Advisory Committee Meeting Report form. The first page of the form does not need to be filled out because the proposal is used in its place.

The defence must be held within 18 months of the start of the PhD (16 months if the student already has an MSc). The format of the exam consists of a 20-minute oral presentation by the candidate, followed by questions relating to ability of student to do PhD work in the area of their thesis, and general knowledge. The student must satisfy the committee in both areas. The examination will be chaired by the Graduate Coordinator, Chair, or designate.

The four possible outcomes of the exam are: a) continuation in the PhD program; b) permission to re-defend; c) transfer to the MSc program; or d) withdrawal from the program. Candidates have a maximum of two opportunities to pass the exam.

It is the responsibility of the student to initiate the proposal process and develop the proposal in coordination with the Supervisory Committee. The student should discuss the scope of the exam with the Committee members in the meetings prior to the exam.

## 2.5 Theses

All graduate students are required to complete and successfully defend a thesis. An MSc or PhD thesis should report original research of such value as to merit publication in a refereed scientific journal and be in a satisfactory and consistent form. Students must familiarize themselves with FGS's [Thesis Format Guidelines](#).

The Guidelines are meant to ensure that high quality manuscripts are produced in a consistent style, and that any reproduction and reduction in size by the National Library results in readable copy. The Guidelines allow for the incorporation of scholarly articles into a thesis.

Before writing a thesis, students are strongly advised to present a detailed outline of their thesis to their supervisor and discuss expectations.

Students are advised to read some examples of theses to get a sense of what is expected. Supervisors may provide suggestions for which thesis to read. MSc and PhD theses are available on the [Faculty of Graduate Studies Online Theses](#) page.

Students must submit a copy of their thesis to FGS for a format check before their thesis defence. To do so, students should e-mail their thesis in PDF format to [thesis.review@dal.ca](mailto:thesis.review@dal.ca) with their banner number and defence date in the e-mail. Students are strongly advised to have their check done well in advance of final submission dates to ensure that there is enough time for any changes to be made.

Final theses must be in PDF/A format for submission to [DalSpace](#). DalSpace is an institutional repository that collects, preserves and distributes digital content produced by members of the Dalhousie community. Hard copies of theses are no longer accepted by [Archives Canada](#) or the [Killam Memorial Library](#).

Before submitting a thesis to DalSpace students must first register/activate their account and then contact [thesis@dal.ca](mailto:thesis@dal.ca) to request access to the Thesis Collection.

For bound copies of theses, please discuss with the Graduate Secretary.

### 3. MSc Thesis Defence

#### 3.1 Composition of the MSc Thesis Examination Committee

The Examination Committee normally consists of the Supervisory Committee, and a Chair (Graduate Coordinator or designate). Detailed regulations on the composition of the MSc Thesis Examination Committee are given in [Section X](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

#### 3.2 MSc Thesis Defence

The agreement of all Supervisory Committee members is normally required before the Department brings forward a thesis for examination. Notices of MSc thesis defences, including an abstract, are posted within the Department of Physics and Atmospheric Science several days before the defence. A display copy of the thesis must be made available to the department office for faculty viewing.

The MSc thesis defence format consists of a 20 to 25-minute talk by the student, at least two rounds of committee questions. The audience is permitted to ask questions at the end of the examination. This is followed by private deliberation by the Examination Committee. The MSc thesis defence is open to the public.

#### 3.3 MSc Thesis Defence Tasks

##### a) Apply to graduate

Students expecting to graduate in October must apply to graduate through [Dal Online](#). The window to apply for Fall Convocation is typically between July 1 and August 31, while students expecting to graduate in the spring must apply between December 1<sup>st</sup> and January 31. Consult with FGS's [Current Students](#) page for the precise deadlines.

##### b) Arrange a defence date

The student is responsible for arranging a date for the Defence that is agreeable to all Examination Committee members. The student then sends the Graduate Secretary the title and abstract of the thesis, as well as the time and date of the defence. The Graduate Secretary books a room for the defence and finds a faculty member to chair the defence. The student should book a projector and a laptop as needed.

To leave sufficient time for corrections, the defence should take place at least 2 weeks in advance of deadline to submit the completed and corrected thesis to DalSpace. See FGS's [Thesis Submission Deadline](#) page for more information.

##### c) Have a format review of thesis done by FGS (see Section 2.5)

##### d) Submit thesis to Examination Committee

Two weeks before the defence, the student must give a copy of thesis to each Examination Committee member (electronic or paper copies, depending on the preferences of the members)

and an electronic copy to the defence Chair. The student is responsible for printing the thesis if paper copies are requested. Colour copies can be made at [Printing Services](#) in the LSC Building.

e) Prepare for the defence

The student should set up the laptop and projector in preparation for the commencement of the defence. An electronic copy of the thesis should be loaded into the laptop so that relevant pages can be displayed during the question period of the defence.



## 4. PhD Thesis Defence

### 4.1 Composition of the Thesis Examination Committee

The Department requires students to defend their thesis within the Department before being allowed to submit it to FGS. The Supervisory Committee assumes the role of the Internal Examination Committee. The Internal Defence is chaired by the Graduate Coordinator or designate.

At the FGS defence, the student is examined by the members of the Internal Examination Committee, plus an External Examiner. The External Examiner should have a PhD, hold an appointment at a university that grants PhD degrees, and have experience examining and supervising PhD students. To ensure arm's length status, they should not be employed in Nova Scotia, should not have a degree from Dalhousie, should not have been involved with the student's research, and should not have co-published with the supervisor.

More information on the qualifications of external examiners is given in the Request to Arrange Oral Defence of a Doctoral Thesis form available on FGS's [Forms and Documents](#) page.

Regulations on the composition of the MSc Thesis Examination Committee are given in [Section X](#) of the [Faculty of Graduate Studies Regulations](#) in the [Graduate Calendar](#).

### 4.2 PhD Internal Defence

The Internal Defence begins with a 40-minute public talk by the candidate, followed by questions from the audience. The examination typically occurs immediately following the public talk, but may take place soon after (e.g., the next day). The Internal Examination Committee questions the student in private. The Graduate Coordinator or designate chairs the defence. The Examination Committee will recommend one of the following outcomes: 1) submit the thesis to FGS; 2) submit the thesis to FGS after specific changes; or 3) make major changes to the thesis and resubmit to the Internal Examination Committee.

### 4.3 PhD Defence Timeline

The timeline is usually dictated by the date when the candidate must submit the completed version of the thesis to graduate in May or October. The timeline below assumes that any changes to the thesis required after the Internal and FGS defences are minor and can be completed within a two-week timeframe. It is the responsibility of the student to initiate the defence process sufficiently in advance of all deadlines to ensure sufficient time for changes to the thesis to be made. The timeline below is intended to complement the timeline given on FGS's [Preparing for your Doctoral Defence](#) page.

#### a) Apply to graduate

Students expecting to graduate in October must apply to graduate through [Dal Online](#) between July 1<sup>st</sup> and August 31<sup>st</sup>, while students expecting to graduate in the spring must apply by between December 1<sup>st</sup> and January 31<sup>st</sup>.

**b) Select dates for the external defence**

At least three months in advance of the FGS defence, the student should find potential dates for the FGS defence that are compatible with the Supervisory Committee members' schedules. The FGS Defence should take place at least two weeks before the deadline to submit the thesis to DalSpace to give the student enough time to make any necessary changes to the thesis required by the Examination Committee. See the [FGS "Thesis Submission Deadlines" page](#) for a list of these dates.

**c) Supervisor submits names of potential external referees**

At least 3 Months in advance of the FGS Defence, the supervisor should complete a Request to Arrange Oral Defence of a Doctoral Thesis form with the name of the potential external examiner and give it to the Graduate Secretary. The supervisor should confirm with the recommended external examiner that he/she is willing to participate in the FGS Defence prior to completing the form. The form is available on FGS's [Forms and Documents](#) page.

Note: FGS regulations stipulate that the student should not know the name of the examiner before the public announcement of the defence.

**d) Arrange internal exam**

The internal defence should take place 7 weeks prior to the FGS defence. This is to ensure that the student has a minimum of 2 weeks to make any necessary corrections to the thesis prior to giving it to FGS. The student finds a time and date for the internal defence that is agreeable to all Examination Committee members. The date is given to the Graduate Secretary, who arranges the room booking and selects a Chair for the defence. The student books the projector and a laptop if necessary.

**e) Have a format review of thesis done by FGS (see Section 2.5)****f) Distribute Thesis**

*At least 2 weeks* prior to the Internal Exam, the student should distribute copies of their thesis to the Internal Examination Committee members (electronic or paper copies, depending on the preferences of the members) and an electronic copy to the Defence Chair. The student is responsible for printing the thesis if paper copies are requested. Colour copies can be made at [Printing Services](#) in the LSC Building.

**g) Internal Defence**

The Internal Defence should occur at least 7 weeks prior to the FGS Defence.

The student sets up the laptop and projector and brings an electronic copy of the thesis so that relevant pages can be displayed during the question period.

**h)** Submit copy of the Department-Approved thesis to FGS

*A minimum of 6 weeks* prior to the FGS Defence, the student submits a PDF copy of both the thesis (approved by the department), their current CV and a Word compatible version of the abstract (max 350 words) to FGS by email ([thesis@dal.ca](mailto:thesis@dal.ca)). FGS delivers the thesis to the external examiner. Note that the student should not know the name of the examiner at this point.

If one of the Examination Committee members cannot attend the defence in person, a written request for remote participation must be sent by email to [thesis@dal.ca](mailto:thesis@dal.ca) *a minimum of 2 weeks prior to the scheduled defence*. This written request, which will be reviewed by the associate Dean, must include the reason for remote participation (cost, scheduling, etc.).

**f)** At the defence

The student sets up the laptop and projector and brings an electronic copy of the thesis.

## 5. Graduate Student Resources

### 5.1 Professional Development

#### Faculty of Graduate Studies

FGS offers a variety of resources on [professional and career development](#).

#### Professional Research and Education Program

[PREP](#) offers monthly workshops and sessions related to professional development

#### Mitacs

Offers free [workshops](#), typically in the spring and fall.

### 5.2 Communication

The [Writing Centre](#) offers supports including staff meet students one-on-one, events, and seminars.

[Effective Science Communication](#) by Sam Illingworth and Grant Allen is a practical guide to surviving as a scientist and is devoted to the variety of ways that scientists are expected to communicate in their day-to-day professional lives. It includes practical advice on how to publish in scientific journals, apply for grants, and effectively communicate research to both scientific and non- scientific audiences. There are also chapters devoted to constructing a digital footprint, dealing with the media, and influencing science policy.

### 5.3 Teaching

The Centre for Learning and Teaching offers a [certificate program](#) in teaching and learning.

### 5.4 Mental Health

The transition from undergraduate studies to a graduate program where goals are longer term and where there is much more uncertainty is a form of stress that many students find difficult to deal with. [Student Health and Wellness](#) provides supports for helping with mental health.