

GRADUATE STUDENT HANDBOOK

Department of Physics and Atmospheric Science



2018/2019

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This handbook is a guide to the formal framework of your MSc or PhD program. This framework has been designed to foster an environment where students will successfully complete their degrees. Some of these regulations originate from the department. Others have been designed by the Faculty of Graduate Studies (FGS). In these cases, students and professors are strongly encouraged to read the FGS Calendar (<http://academiccalendar.dal.ca>) and the FGS (<http://www.dal.ca/faculty/gradstudies.html>) site for additional information.

Disclaimer: In the case of any discrepancy between this handbook and FGS Calendar, the FGS Calendar will have precedence.

Table of Contents

1. General program information and procedures	3
1.1 Registration	3
1.2 Supervisory Committees	3
1.3 Program Form	4
1.4 Changes to Student's Program	4
1.5 Leave of Absence	5
1.6 Transfer from MSc to PhD	5
1.7 Progress Reports	5
1.8 Financial Assistance	6
1.9 FGS Travel Support	7
1.10 Responsibilities and Rights of Students and Supervisors	7
1.11 Appeals	9
1.12 Conflict Resolution	10
1.13 Extensions	11
1.14 Academic Integrity	11
2. Program Requirements	12
2.1 Course requirements	12
2.2 Seminars	13
2.3 Supervisory Committee Meetings	13
2.4 Doctoral Preliminary/Comprehensive Exam	14
2.5 Thesis	14
3. MSc Thesis Defence	16
3.1 Composition of the MSc Thesis Examination Committee	16
3.2 MSc Thesis Defence	16
3.3 MSc Thesis Defence Timeline	16
4. PhD Thesis Defence	18
4.1 Composition of the PhD Thesis Examining Committees	18
4.2 PhD Internal Defence	18
4.3 PhD Defence Timeline	18
5. Graduate Student Resources	21
5.1 Professional Development	21
5.2 Communication	21
5.3 Teaching	21

1. General program information and procedures

1.1 Registration

Graduate students must maintain their registration in all three terms until their program is completed, except in those cases where a formal Leave of Absence has been officially approved by the Faculty of Graduate Studies. The deadline for the Fall registration is usually at the beginning of August. It is usually more convenient for students to register at this time for the entire year, if they anticipate continuing for an entire year. More information is provided at:

<http://www.dal.ca/faculty/gradstudies/currentstudents/registration.html>

The course registration numbers (CRNs) for all courses can be found on the academic timetable:

http://www.dal.ca/academics/academic_timetable.html

All Students:

Each term, all students must add the Fee Generating Course, REGN 9999 and register for a course number that is associated with their thesis:

MSc students register for either PHYC 9000, or MEDP 9000 if they are a Medical Physics student.

PhD students register for either PHYC 9530, or MEDP 9530 in the case of Medical Physics.

If REGN 9999 and PHYC 9XXX is not added in the Banner registration system each term, then the graduate student is not considered registered. **Failure to register for PHYC9XXX and REGN 9999 will cause a stop in your pay, including non-payment of scholarships and stipends !!!**

In both the **Fall and Winters** terms of each year, all students must register for a seminar course: MEPD 6416 for Medical Physics students, PHYC6801 for MSc Physics and Atmospheric Science and PHYC6802 for PhD Physics and Atmospheric Science students.

PhD students who have not passed their Comprehensive/Preliminary exam:

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

PHYC 9520 – Prelim Doctoral exam in Physics or Atmospheric Science
MEDP 9520 – Prelim Doctoral exam in Medical Physics

1.2 Supervisory Committees

The Supervisory Committee ordinarily consists of the supervisor(s) plus two additional members. Each member must be either a faculty member or an adjunct faculty member. The composition of the Supervisory Committee is specified in the *Program 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 Form

In the first month of study, the student should fill out a hard-copy *Program Form* in consultation with your supervisor. The forms can be downloaded from FGS:

<http://www.dal.ca/faculty/gradstudies/currentstudents/forms.html>

The Program Form includes the program requirements, the classes that you are required to take, as well as the names of the faculty members who will serve on your Supervisory Committee. (Signatures on the hard copy are not required, as this will be done electronically). The student gives the form to the Graduate Secretary who will then enter them into the Graduate Studies Information System (GSIS). GSIS is the component of Dal Online that keeps track of your graduate program, from admission through to convocation. Details about the system are available at:

<http://www.dal.ca/faculty/gradstudies/currentstudents/gsis.html>

Once the form is entered on GSIS, you will be notified by e-mail to sign the form electronically. The form is digitally signed first by the student, then the supervisor, Graduate Coordinator and finally FGS.

The *Program Form* constitutes an agreement between the student and the university on the requirements to complete the program. Before graduation, FGS will review the students *Program Form* to ensure all requirements are met. The student will not be able to graduate if there are any deficiencies. It is the responsibility of the student to ensure the information in the *Program Form* is accurate.

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

1.4 Changes to Student's Program

The supervisor and Graduate Coordinator must approve any change to your program. These changes include transfer from MSc to PhD, entrance to another program, other employment, a change full-time to part-time status (only applicable to MSc students only), a change in course requirements, a change in the Supervisory Committee, *etc.* FGS must be notified of any of these changes through a *Program Update Form*. These forms can be downloaded from FGS:

<http://www.dal.ca/faculty/gradstudies/currentstudents/forms.html>.

A hard-copy 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 again be notified by e-mail when it is ready to be electronically signed on GSIS. The forms will then be digitally signed by the supervisor, the Graduate Coordinator and finally FGS.

1.5 Leave of Absence

A leave of absence must be approved by FGS. The request is made through a *Request for Leave of Absence* form that can be downloaded from FGS:

<https://cdn.dal.ca/content/dam/dalhousie/pdf/fgs/currentstudents/loa.pdf>

The request must be submitted prior to the term for 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

Transfers from MSc to PhD must be submitted well in advance of the beginning of the term where the transfer is to take place. However, once a 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 Form* (see section 1.3) within the first month of when the change takes place.

MSc students contemplating a transfer to the PhD program are encouraged to submit a *Program Update Form* well before the end of their first year:

<http://www.dal.ca/faculty/gradstudies/currentstudents/forms.html>.

Such changes 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

The Faculty of Graduate Studies 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 his/her 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 (see the GSIS page for [instructions](#)). Once you submit your report, 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. FGS provides a description of many scholarships and fellowships at,

<http://www.dal.ca/faculty/gradstudies/funding/scholarships.html>.

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 work 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 would normally be 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. Students should see the FGS web site for further details.

The Nova Scotia Graduate Scholarships (NSGS) are available for MSc and PhD students. The student cannot 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 a Master's to a PhD program must apply for the Doctoral scholarship before they begin the Doctoral program. Information about the MSc NSGS awards are available on the FGS scholarships page given above.

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 they do not understand. They are also encouraged to monitor their subsequent pay cheques 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. It is normally given only for presentation of a poster or paper at scholarly meetings. Students are eligible for one travel grant during the period of their graduate degree program at Dalhousie, and should be presenting research related to their thesis. Students should consult the FGS website for details.

The University requires that your travel claim be submitted within 30 days of completion of travel. Your completed travel claim form should be accompanied by all relevant original receipts (detailed receipts must be provided with credit card slips). The form must be signed by both the traveller and the supervisor. Failure to complete a travel claim within the time specified may result in required pay-back of any FGS Travel Grant Funds. Link to the Travel Expense Claim Form, and instructions for completion, are found here:

<https://www.dal.ca/dept/financial-services/For-Staff-and-Faculty/travel/how-to-complete-expense-claim-form.html>

1.10 Responsibilities and Rights of Students and Supervisors

The rights and responsibilities of students, supervisors, and the Department are outlined in Section 9.4 of the [Faculty of Graduate Studies Regulations](#) in the Graduate Calendar and reproduced below.

Responsibilities of Supervisors

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

1. to provide reasonable access to their student(s) and to be available for consultation at relatively short notice;

2. to be as helpful as possible in suggesting research topics and in assisting students to define their theses;
3. to tell students approximately how long it will be before written work, such as drafts of chapters, can be returned with comments;
4. 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;
5. 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;
6. to know the departmental 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;
7. 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;
8. 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;
9. 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:

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

Rights of Supervisors

1. to expect students to give serious and considered attention to their advice concerning what they regard as essential changes in the research and thesis;
2. to terminate supervision and advise the student to find another supervisor if 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;
3. to have their thesis supervision properly credited by the department 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;
4. to have the thesis-writer acknowledge, by footnoting, all portions of the supervisor's own research over which the supervisor wants to retain future rights of authorship;

5. to have thesis-writers give permission for the results of their research to be used for the benefit of a larger project when they are working as assistants with their supervisor on research that is part of such a 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

1. to have a clear understanding of what is expected in thesis writing (expected length, acceptable methodology, validity of topic, notification of progress);
2. to expect help from their supervisor in establishing a feasible topic, in solving problems and assessing progress as the thesis is being written;
3. to receive a fair assessment of the completed thesis and explanations of negative criticism;
4. to be allowed to have a new supervisor when they can offer convincing reasons to the department for the change and the change can be reasonably accommodated by the Department;
5. to be protected from exploitation by their supervisor or other faculty members if the latter should:
6. intrude upon the student's right of authorship or fail to give a student authorship credit for team research (where applicable, the department's protocols on authorship should be provided to students before they embark on research), or
7. divert the student's efforts from the timely completion of the thesis;
8. 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 Department.

1.11 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 following is the procedure the student is required to follow in an appeal:

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 Graduate Calendar.

1.12 Conflict Resolution

Problems are easier to manage if they are addressed early, and in a timely manner (do not wait for a lengthy period of time to pass before presenting an issue of difficulty). It is important to make written notes of the incident(s), including the date and time of the occurrence so that you clearly articulate the facts and have documentation in event you choose to make a formal appeal.

The following are the recommended step to resolving a conflict:

1. Speak directly with your thesis supervisor (if problem is related to supervision) or course instructor (if 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, Department Chair, then the student should:

4. Contact FGS as per procedures noted in a Section 1.11 on appeals (appeals of regulations or guidelines or any other difficulty should first be made to the Graduate Coordinator.)

The detailed FGS appeals process can be found in Section XII of the [Faculty of Graduate Studies Regulations](#) in the Graduate Calendar

1.13 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 the FGS calendar for regulations on extensions.

1.14 Academic Integrity

It is of vital importance that you properly cite the work of others that you use and/or describe in your 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 Section on [Intellectual Honesty](#) in the “University Regulations” of the Graduate Calendar.

2. Program Requirements

2.1 Course requirements

The course requirements for Medical Physics and Physics and Atmospheric Science differ as described below. However, note that the passing grade for any course is B-, which is set by FGS. If a student obtains a grade less than B-, this is recorded as a 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 have some relevance to the students' research and they do not have to be offered by the Department of Physics and Atmospheric Science. This A list of graduate courses is given on the Departmental website:

<http://www.dal.ca/faculty/science/physics/programs/graduate-programs/graduate-classes.html>

MSc students are normally required to complete four 3-credit hour courses (*i.e.* a regular 1-semester course) at the 5000 level or higher. The PhD program normally requires a minimum of three 3-credit hour courses. 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. However additional courses taken during the 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 Program is accredited by the Commission on Accreditation of Medical Physics Educational Programs (CAMPEP, see <http://www.campep.org>). The MSc program is strictly a two-year program, while the PhD program is normally 4 years. The Medical Physics curriculum requirements are set to satisfy the CAMPEP standards and consist of 8 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 8 core Medical Physics courses. A list of the core courses is available on the Departmental website:

<http://www.dal.ca/faculty/science/physics/research/centres-and-labs/medical-physics.html>

Note that Medical Physics Students should register for the 8 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 programs. The Certificate Program is one year in duration and consists of the 8 core courses that are part of the Medical Physics MSc and PhD programs.

2.2 Seminars

Students are required to attend the 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 / Comprehension Exam

Every graduate student is required to give *at least one* talk a year in one of the Department's regular graduate seminars series, although the specific requirements within Physics, Atmospheric Science and Medical Physics vary. 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.

Supervisory Committees should meet ***at least twice a year*** during the thesis research period and more often in the writing stages of a student's program. At least one week prior to the meeting, the student should fill out the first page of the *Supervisory Committee Meeting Report* and distribute it to all Committee members together with their CV. The first meeting should occur during the student's first semester to discuss expectations for their program. For PhD students, the second meeting should discuss expectations for their preliminary examination. Subsequent meetings will focus on progress of the student's research. The form can be downloaded from:

http://fizz.phys.dal.ca/~atmos/meeting_report.pdf

The student brings the entire form to the meeting for the Committee to fill out. The student books a room and if necessary a laptop and data projector from the Office. The student must also e-mail all Committee members a confirmation of the time and date of the meeting.

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 his/her Doctoral research project, and is also orally examined on subjects relevant to the general area of the candidates research.

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 defence. The report should have the following:

- abstract
- literature survey
- statement of proposed research objectives
- work plan
- time-line

The candidate should book the room and projector for the meeting. The candidate should also bring a *Supervisory Committee Meeting Report* form:

http://fizz.phys.dal.ca/~atmos/meeting_report.pdf .

The first page does not need to be filled out as 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 defence.

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 during their first committee meetings.

2.5 Thesis

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 the Thesis Format Guidelines available from FGS

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/format.html>

These Guidelines allow for the incorporation of scholarly articles into the thesis. The Thesis Format Guidelines are meant to ensure that high quality manuscripts are produced in a consistent style and that reproduction and reduction in size done by the National Library produce readable copies.

Before you start writing your thesis, you are strongly advised to present a detailed outline of your thesis to your supervisor and discuss the expectations with them. MSc and PhD theses are available on DalSpace

<https://dalspace.library.dal.ca/xmlui/handle/10222/11163>

You would be well advised to read some examples of theses to get a sense of what is expected. Ask your supervisor for suggestions of which thesis to read.

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 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.

Your final e-thesis 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. It is also a way to permanently preserve your work. Hard copies of theses are no longer accepted by Archives of Canada or Killam Library.

Before submitting your thesis to Dalspace you must first register/activate your account and then contact thesis@dal.ca to request access to the Thesis Collection.

If you would like a bound copy of your thesis, talk to 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 10.3 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 a 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 20-25 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 Timeline

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 1st and January 31. Consult with FGS for the precise deadlines:

<http://www.dal.ca/faculty/gradstudies/currentstudents.html>

b) Arrange defence date.

The student is responsible for arranging a date for the exam that is agreeable to all Examining Committee members. The student then sends the Graduate Secretary the title and abstract of the dissertation, 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 books the projector and a laptop if necessary.

In order 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 the FGS site for thesis submission deadlines:

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/submission.html>

c) Have a format review of thesis done by FGS

(see Section 2.5)

d) Submit thesis to Examining Committee

Two weeks before the exam, the student must give a copy of thesis to each Examining 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 the Print Centre in the LSC Building.

e) At the 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.

4. PhD Thesis Defence

4.1 Composition of the PhD Thesis Examining Committees

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, not have a degree from Dalhousie, not have been involved with the student's research, and not have co-published with the supervisor. More detailed information on the qualifications of external examiners is given in the *Request to Arrange Oral Defence of a Doctoral Thesis* form:

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/forms.html>.

The Detailed regulations on the composition of the MSc Thesis Examination Committee are given in Section 10.3 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 Examining Committee questions the student in private. The Graduate Coordinator or designate chairs the defence. The Examining Committee will recommend one of the following outcomes: 1) submit the thesis to FGS, 2) submit the thesis to FGS after specific changes, 3) make major changes to the thesis and resubmit to the Internal Examination Committee at a later date.

4.3 PhD Defence Timeline

The time-line 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 time-frame. 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 PhD timeline given on the FGS web site:

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/defense.html>.

a) Apply to graduate

Students expecting to graduate in October must apply to graduate through [Dal Online](#). They apply Convocation between July 1st and August 31st, while students expecting to graduate in the spring must apply by between December 1st and January 31st. Consult with FGS for the precise deadlines:

<http://www.dal.ca/faculty/gradstudies/currentstudents.html>

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 examining committee. See the FGS site for a list of these dates:

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/submission.html>.

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.

<http://www.dal.ca/faculty/gradstudies/currentstudents/thesesanddefences/forms.html>.

Note: According to FGS regulations, 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 Examining 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 distributes copies of his/her thesis to all the Internal Examining 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 the Print Centre 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). 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 Examining Committee members cannot attend the defence in person, a written request for remote participation must be sent by email to 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

My Grad Skills

<https://www.mygradskills.ca/> On-line modules to help develop professional skills

Professional Research and Education Program

Offers monthly workshops and sessions related to professional development

<https://www.dal.ca/faculty/prep.html>

Mitacs

Offers free workshops, typically in the spring and fall

<https://www.mitacs.ca/en/programs/step/step-workshops>

Advice from an industrial physicist

<http://www.aps.org/units/fed/newsletters/spring2013/industry.cfm>

5.2 Communication

Suggested reading: “Effective Science Communication” by Sam Illingworth and Grant Allen

<http://iopscience.iop.org/book/978-0-7503-1170-0>

This practical guide to surviving as a scientist 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 your work in scientific journals, apply for grants, and effectively communicate your research to both scientific and non-scientific audiences. There are chapters devoted to constructing a digital footprint, dealing with the media, and influencing science policy. Guiding you throughout are several useful exercises that will help you to become a more effective communicator, providing a helping hand in your scientific journey to not only survive, but to prosper in the process.

Dalhousie Writing Centre

https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

5.3 Teaching

TA Research Day

Hosted Annual in September https://www.dal.ca/dept/clt/events-news/TA_Days.html

Centre for Learning and Teaching

Offers a certificate program in teaching and learning:

<https://www.dal.ca/dept/clt/services/CUTL.html>