

Things You Should Know

Department of Chemistry
University of Manitoba
Graduate Student Handbook

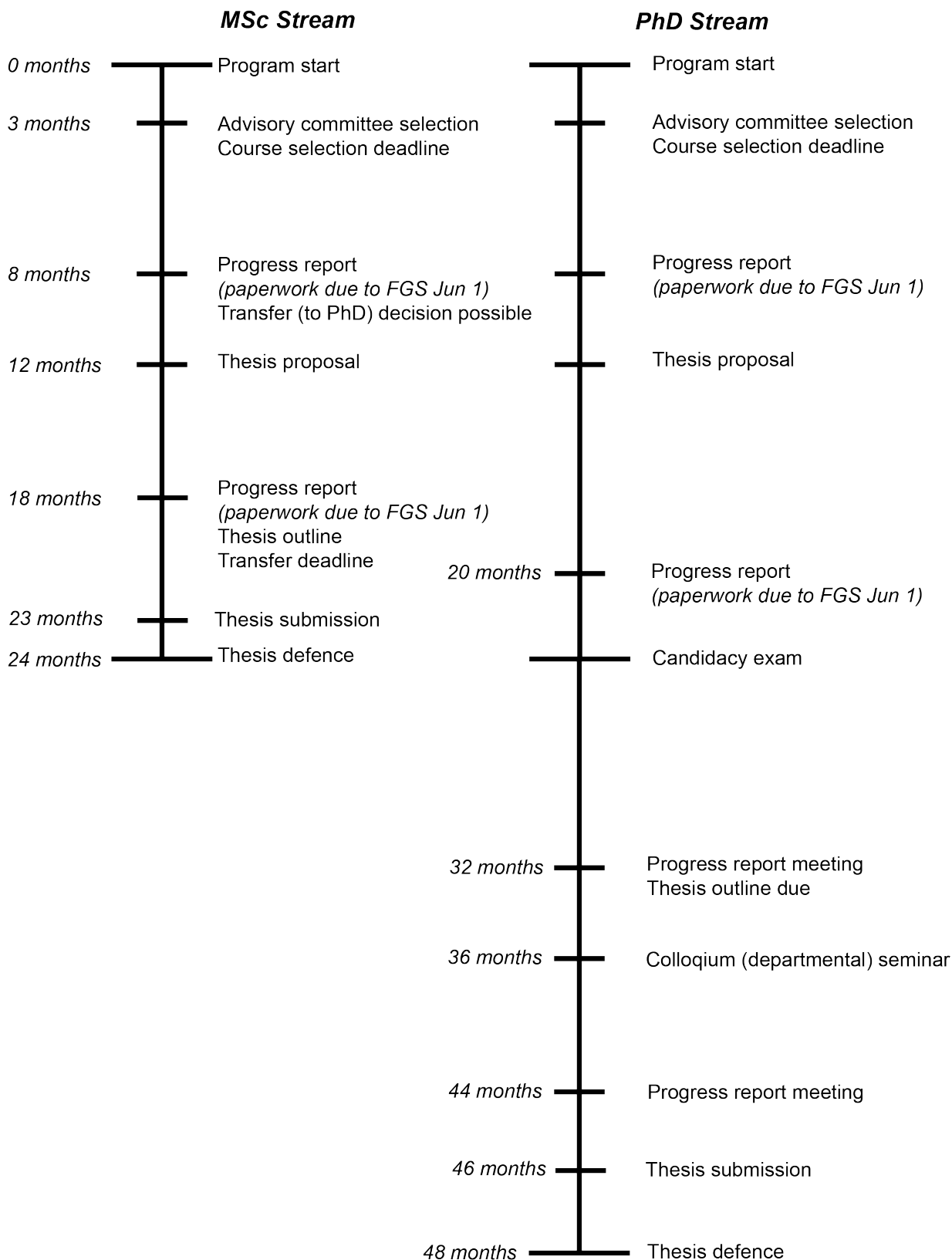
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Additions? Corrections? Suggestions? david.herbert@umanitoba.ca

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TIMELINE



****Note that these timelines reflect a fall (September) start with respect to the timing for the Progress reports (i.e., at the 8 month mark), as progress meetings are usually held in April/May.**

MISCELLANEOUS

Initial Registration

Congratulations! You made it to U of M! Now go visit the main office (Parker 360). You need to complete a few more registration steps before you can officially begin.

People to Know

Associate Head (Graduate) and Chair of Graduate Student Status Committee: Georg Schreckenbach (Parker 596, Georg.Schreckenbach@umanitoba.ca)

Chair of Scholarship Committee: Mazdak Khajehpour (Parker 468, Mazdak.Khajehpour@umanitoba.ca)

Contact for TA Questions: Main Office (Parker 360B)

Course Registration Questions? Associate Head (Graduate) Georg Schreckenbach or Tannis Wills (Parker 360, tannis.wills@umanitoba.ca)

Contact for HR Issues (payroll, etc.): Tricia Lewis (Parker 360, Tricia.Lewis@umanitoba.ca)

Contact for Travel Claims, Grant Finances, etc.: Grace Ntungo (Parker 360, Grace.Ntungo@umanitoba.ca)

Contact for WHIMS Training, Department Safety: John Sorensen, John.Sorensen@umanitoba.ca)

Seminar Series Organizer 2019/2020 (this changes year to year): Sabine Kuss (Sabine.Kuss@umanitoba.ca)

Student Colloquium Organizer: Associate Head (Graduate) Georg Schreckenbach

Chemistry Graduate Students Association: <http://home.cc.umanitoba.ca/~chemcgsa/>

U of M Graduate Students Association: <http://www.umgsa.org/>

Orientation

A series of group orientation sessions will be held at the beginning of the fall term for all students who have started since the last orientation session (e.g., winter or summer starts from the previous year, in addition to those starting in September). Attendance is mandatory.

These sessions will be useful! For example, within your first few months, you will need to complete the Student-Advisor Guidelines. These are available via your JUMP account. What's JUMP? You will learn about such things (and more!) at orientation.

In your first few months you will also be required to write the **ACS Placement Test** for your chosen sub-discipline (analytical, biochemistry, inorganic, organic, physical). The test result (score) and your percentile (comparison with all test writers) will be provided to you and your advisor. These results are meant to help you figure out where you stand with respect to the core knowledge required for your degree, and to help you identify good courses to take to help you bolster this knowledge base. **Check with the Grad Chair during orientation to find out the test date.**

Safety Training

There are a number of safety sessions that must be completed in order to begin laboratory work. These include WHIMS (see John Sorensen, John.Sorensen@umanitoba.ca), laboratory-specific training (speak to your advisor), TA safety training (speak with the course coordinator for the course you are TA-ing), fire extinguisher training (see John Sorensen). Lab-specific safety orientation is required, for example, before you may be issued a lab/office/building key. **As per new Department of Chemistry policy, each student/PDF/researcher is required to undergo annual lab-specific safety training to be run by the PI of each lab. You will be required to sign a record of this training every year. Speak to your advisor for details.**

Facilities Training

If you plan to heavily use departmental facilities, see the appropriate people to schedule training as soon as possible.

NMR: Dr. Dave Davidson (320, 338 Parker, 474-6259, david.davidson@umanitoba.ca)

Mass Spectrometry: Emy Komatsu (emy.komatsu@umanitoba.ca)

MCAL (GC, mass spec etc.): Dr. Tom Ward (306, 318 Parker, Tom.Ward@umanitoba.ca)

Manitoba Institute for Materials (SEM, TEM, XPS): Spectroscopy Manager - Dr. Ravinder Sidhu (ravinder.sidhu@umanitoba.ca)

MIM Operations Coordinator - Jolly Hipolito (jolly.hipolito@umanitoba.ca)

Other facilities are available off-campus. Some options for glass-blowing and machine work are:

Glass Blowing: *off-campus*; Lesa Cafferty (caffertyglass@gmail.com)

Machine Shop: *off-campus*; Andrew Pankewycz (panke014@umn.edu)

Other infrastructure is available in the department, but may require discussion with the appropriate faculty member. Visit faculty member websites or ask around to see what's available!

Chemical Inventory

All chemicals purchased in the Department of Chemistry (as well as other departments) are logged in an electronic inventory database, accessible at <https://apps.hechmet.ca/login.aspx>

Each group has a username (typically first.lastname of PI) and password. Ask your advisor about this, or for questions in general, speak to Sharon Mullen (Sharon.Mullen@umanitoba.ca).

To view your inventory, or search for a chemical, click in the home page "chemical" to access the chemical module and then, on the left side menu, choose View/Update.

To search for chemicals in the department, click search, and you will see all the chemicals in the Chemistry Department and Chemistry's Store Rooms.

To see only your lab's chemicals, select your PI's name in the pull-down menu marked "PI", or look for your lab in the pull-down "location". For example, select University of Manitoba, Parker building, and then Parker 500 level where you will find the "Parker 572 - David Herbert Lab" location and sub-locations. You then can search by location (select using the pull-down menu and then click search) and see all the chemicals in your lab or by chemical name (note the pull-down menu "is/contain/..." etc.)

When you place a purchase order, please note the sub-location where you will store the new chemicals (e.g. chemicals shelves) When you add chemicals to your inventory without placing a purchase order (by borrowing, transferring, moving from another location, etc.) remember to send an email to Chemical.Inventory@umanitoba.ca with the name of the chemicals or lab codes and the new locations and sub-locations.

To dispose of chemicals, peel off the barcode label attached to the container and attach it to the proper disposal form that should be available in your lab. Remember to drop off the form at Chemical Stores so the inventory can be updated appropriately.

Any questions should be addressed to Betty Lerner, Safety Coordinator (506 Machray Hall, Betty.Lerner@umanitoba.ca or SciSafe@umanitoba.ca)

Stipend

The minimum annual stipend guaranteed for each graduate student is 20k (MSc, first 2 years of degree) and 22k (PhD, first 4 years of degree). The source for this funding is typically a combination of research funding from your advisor, TA assignments, and FGS funding (GETS), but can possibly include other sources. After discussing with your advisor, see **Tricia Lewis** in the main office (Parker 360) upon arrival to get set-up. *Please note it may take weeks for your first paycheck to arrive!*

Teaching Assistantships (TA)

See *Supplementary Regulations: p 15; box 4.7.5 (MSc); p 25, box 5.6.2 (PhD)*

Teaching is an important part of your graduate training. Explaining concepts in chemistry lab settings will help prepare you for your candidacy and defense, as well as for your future career! You will learn a lot about communication and science, and bolster your resume at the same time. You will therefore be required as part of your degree to serve as a TA in three to four 3-credit hour undergraduate courses per year.

A note on taking your TA and invigilation responsibilities seriously...

Many of you may be able to remember that first enthusiastic, exciting graduate student TA as the one that really got you hooked on science and research. Now that you “are that TA”, it’s important to remember that there are many, *many* impressionable eyes watching you in the teaching lab, during exams and review periods, and that it really is your responsibility to make sure you conduct yourself in an appropriate manner at all times. Just like in a movie theatre, please be sure to leave your phone off or at home during labs or exams, and give those students your full attention. Who knows, some of them may end up being your lab mates!

Scholarships and Awards

There are many scholarships and awards available to U of M graduate students. You should actively pursue as many of these as possible! Awards/scholarships/fellowships can help support your graduate studies, and receiving an award can be a prestigious addition to your resume.

For more information, see:

<http://umanitoba.ca/faculties/science/departments/chemistry/students/grad/Fellowships.html>

NSERC Postgraduate scholarships (for Canadian citizens and permanent residents):

http://www.nserc-crsng.gc.ca/Students-Etudiants/PG-CS/index_eng.asp

University of Manitoba Graduate Fellowships (UMGFs):

Announcement of annual competition should be sent out in January each year. Please see the GSSC Chair for more information.

Internal awards:

An application form and a supervisor assessment form are circulated each year, usually in August. Please see the head of scholarships and awards committee (TBA) or the GSSC Chair for more information.

International student funding opportunities:

http://umanitoba.ca/faculties/graduate_studies/funding/international.html

Conference Travel Support

Support is available from a variety of sources such as FGS, the Faculty of Science and the Chemistry Department, the UMGSA and the CGSA to help students give talks and posters at conferences. Visit the departmental website for more information and be sure to ask more senior graduate students or talk to the CGSA president about opportunities.

http://umanitoba.ca/faculties/science/departments/chemistry/Chemistry_Grad_Student_Conference_Travel_Assistance_Application.pdf

Departmental Seminar Series

Department-wide seminars are held each week on Friday from 3:30-4:30 pm (ARMES 201 – *check weekly announcements for possible room changes!*) throughout the academic year (September to April). These seminars are a mix of external speakers brought into the university to give research lectures. These talks are a great way to learn new science and also a great opportunity to test your understanding by participating (asking questions). **Regular attendance is mandatory throughout your graduate program.**

DEGREE REQUIREMENTS

*This is a summary that follows the timeline from **page 3** of this document. For additional information, consult the Faculty of Graduate Studies (FGS) Official Regulations and the Department of Chemistry's Supplemental Regulations. Both sets of regulations are available as a single document on the FGS website at the link below.

When reading the regulations, note that the box on the *left* contains the FGS regulations. These apply university-wide, for all programs. The boxes on the *right* contain the *supplementary regulations* that apply only to Chemistry. Sometimes the box on the right (the Chemistry-specific supplementary regulations) contains different requirements from the box on the left (the general FGS regulations). *The regulations outlined in the box on the right will always supersede those in the box on the left.*

http://umanitoba.ca/faculties/graduate_studies/media/CHEMISTRY__2015.pdf

Advisory Committee Selection

MSc stream, see - Supplementary Regulations: p. 13, box 4.6

PhD stream, see – Supplementary Regulations: p. 22, box 5.2.3

Your committee **must** be established within 3 months of starting. Select your committee with the help of your advisor and be sure to complete the correct form on the Department website

(http://umanitoba.ca/faculties/science/departments/chemistry/about_chem/2140.html) and submit to the Faculty of Graduate Studies (ask in the main office if you are unclear about how to do this). A minimum of three (MSc) or four (PhD) members are required depending on your stream, including your advisor. At least 50% of the committee must hold a **primary appointment** in Chemistry. At least one member must hold **no appointment** in Chemistry (external member).

Note – if your advisor is an adjunct faculty member with the Department of Chemistry, your advisor does not hold a primary appointment in the Department of Chemistry. You will therefore likely require a larger committee to ensure that 50% of your committee members have primary appointments in Chemistry.

The role of your committee is to help guide your research and learning during your graduate program, make sure you meet the standards of your program, and make sure standards are consistent across the university (hence, the need for an external member). They can also help advise you should you have a problem you feel you can't discuss directly with your advisor, offer opportunities for networking, etc.

Courses

Supplementary Regulations: p. 11; box 4.4.1 (MSc);

For all streams, you **must** take the seminar course (CHEM7900), typically offered in the **Winter Term** and you **must** attend departmental seminars throughout your graduate program.

How many additional courses are needed is then stream-dependent:

MSc stream: need an additional 2 classes (6 credit hours) at the 7000 level. **See Supplementary Regulations, p 11, box 4.4.1**

PhD stream (entry holding a recognized MSc degree): need an additional 2 classes at the 7000 level. **See Supplementary Regulations p 23, box 5.4**

PhD stream (transfer entry from U of M Chemistry MSc stream, holding a recognized MSc degree from elsewhere): need an additional 2 classes at the 7000 level. This total (6 credit hours) includes the courses you took at U of M prior to transfer. This means if you transfer having taken 3 courses (9 credit hours, including the Seminar Course CHEM7900 which in the past has been run in the Fall semester) at U of M as an MSc student (meeting all necessary graduate GPA requirements) and hold a recognized MSc degree, you may not need to take any additional classes, provided your committee approves. **See Supplementary Regulations p 23, box 5.4**

PhD stream (direct or transfer entry with BSc): need an additional 4 classes (12 credit hours) at the 7000 level. This total (12 credit hours) includes the courses you took at U of M prior to transfer. **See Supplementary Regulations p 19, box 5.1.2**

Acceptable classes are usually part of the Chemistry program, but courses in other departments may be acceptable. Talk to your advisor and consult your advisory committee when possible. *For all classes, you need to maintain a graduate GPA of at least 3.0 and not get below a C+ in any one course.*

Academic Integrity: Plagiarism, Fair Use and Writing With Integrity

An integral part of your graduate education is learning to effectively communicate scientific ideas. You will learn to do this in presentations (for example, in the seminar course, group meetings, at conferences) and in writing (for example, written course work, your thesis proposal, reports to your

supervisor, conference posters and manuscript drafts). **It is now mandatory for all students to complete GRAD 7500 – Academic Integrity Tutorial in their first term of registration. Please check with the main office to ensure you are registered for this course/tutorial.**

Learning to convey complex scientific concepts in an original way is hard! It takes lots of practice (which you will get), and you must be very careful to avoid plagiarizing others' writing (even if they have phrased something really nicely!). This includes documents you might work on together with your advisor (for example, a thesis proposal). Be sure that written documents that you are the sole author of (e.g., thesis work) are written *by you*. If you are uncertain about what this means, talk to your advisor.

For more information on the University of Manitoba's policies on Academic Integrity, see:

http://umanitoba.ca/student/resource/student_advocacy/academicintegrity/Academic-Integrity-policies-and-procedures.html

For the Student Advocacy web-resources on plagiarism, see:

http://umanitoba.ca/student/resource/student_advocacy/cheating_plagiarism_fraud.html

COMMITTEE MEETINGS AND PRESENTATIONS

****Note that your advisory committee MUST physically attend your annual progress report meetings (MSc: see **Supplementary Regulations, p 13, box 4.6.1**), candidacy examination and research seminar AKA 'colloquium' (PhD: see **Supplementary Regulations, p 22, box 5.2.3**) and that any exceptions to this must be cleared by the Faculty of Graduate Studies. *In the event of a problem with full committee attendance, be sure to speak with the Associate Head – Graduate/GSSC well in advance of your anticipated meeting date.* Please also note that there is no requirement to meet with your committee to approve your thesis proposal. This can be done via email communication.**

Some general points about progress report meetings:

In recent years, the Department of Chemistry has placed more emphasis on using APR meetings to help students get used to vigorous and in-depth discussion of their science, to better prepare you for situations you might find yourself in in your Candidacy Exam or Thesis Defence. **To help you know what to expect, here are some of the guidelines provided to committee members in advance of an APR meeting:**

Guidelines for Annual Progress Report (APR) Meetings

The Advisory Committee plays a key role in the progression of a graduate student through their program, verifying milestones and upholding standards. A student and their advisory committee can meet as often as necessary, though normally meetings are held annually. It is critical that the Annual Progress Meetings **probe student proficiency in chemistry and identify areas for improvement**. As there are often one-year gaps between meetings with the committee, it is important that the members of the Advisory Committee use every APR meeting to its full potential, particularly in the first half of the MSc and PhD.

Discuss with the student any upcoming milestones and the expected timeline including:

- Completion of course work
- Thesis proposal

- Transfer to PhD
- Candidacy exam
- Colloquium
- Thesis writing

On the progress report form, please be sure to check the appropriate boxes regarding completion of course work, approval of thesis proposal etc. Every line must be checked; every date filled in before signing.

Form: http://umanitoba.ca/faculties/graduate_studies/media/Progress_Report_2019.pdf

Before preparing the written portion of the form (goals met, goals for coming year, rating), consider the following types of questions in your assessment. These are important, particularly at the first two meetings, to assess student knowledge and progression as well as to identify shortcomings and set appropriate expectations at an early stage. Consider each meeting as another step in the preparation for the final thesis defense.

- Can the student clearly explain what they will do, what will be learned and why this is important?
- Can the student explain what techniques they will use, how the experiments will answer central questions of their research and why these techniques were chosen over others?
- Does the student have a familiarity with relevant literature?
- Does the student have a solid understanding of the background theory relevant to their research and research methods?
- Can the student put their work into context in their research field? In a broader field?

Some FAQs About Annual Progress Report (APR) Meetings:

1) How do I know if I need to do an APR this year?

*APR meetings are required for ALL students registered in the program. The only exception is students who plan to **defend** their thesis by August 30 of this year.*

2) What if I plan to defend my thesis this summer but end up needing more time to finish?

If in doubt, please hold an APR meeting before June 1st, even if only to update your committee on your thesis preparation. It will be much easier to get your committee together now than in July/August.

3) I just started in January. Do I need to have an APR meeting by June 1st?

Yes!

Progress Report #1

Supplementary Regulations: p. 14; box 4.7.3 (MSc);

Progress report meetings must be held annually with your committee, and normally take place in the spring (April/May). Part of this process involves completing a form (see above for link), which

your advisor must submit to FGS following each meeting. **This form becomes part of your official record with FGS.** *The annual deadline for submission of these forms to FGS is June 1, so be sure to hold your meeting well in advance.* At least one week in advance, you need to send a copy of your presentation to your committee for them to review.

These meetings are typically ~ 1-2 hours long. Prepare a ~20 min presentation introducing yourself, your research project and summarizing what you've done so far (courses taken, research progress, outreach work) and what you plan to do. Show your committee a **timeline** for the next year or years.

In the **MSc stream**, if you start in the summer or fall, your first meeting (April/May of the following calendar year) will be held at the ~8-12 month mark. At this meeting, your committee may discuss a request to transfer to the **PhD stream**.

Note: A January start in the MSc stream means your first meeting will be held only after ~4-5 months in the program, which is typically not enough time to evaluate a transfer request (*vide infra*).

Requirements for transfer from MSc to PhD stream:

Supplementary Regulations: p.19, box 5.1.3

- Complete seminar course (7900) + 6 additional credit hours
- Maintain a *minimum graduate* GPA of 3.75;
- Show a capacity for independent, original research (talk to your advisor)
- Have your advisor's approval

*If you meet all these criteria, and have your advisor's approval, you then must **submit an application to FGS (via GradConnect) for entry into the PhD program ~ 2 months in advance of your intended transfer date, even if your courses are still in progress.** The members of the Chemistry GSSC, chaired by the Graduate Chair, will then make a final recommendation about your transfer to FGS, who are responsible for a final decision.*

http://umanitoba.ca/faculties/graduate_studies/media/cte_selection_report.pdf

Thesis Proposal

MSc Stream (see Supplementary Regulations p 15, box 4.8.1.1)

PhD Stream (see Supplementary Regulations p 28, box 5.9)

3,000-5,000 words excluding figures, tables, schemes and references. This should demonstrate you understand (a) your research plan – *what you will do*; (b) your approach – *how you will do it*; and (c) the context of your work – *why you will bother*. Your committee will evaluate your proposal and pass/fail it. You may be given the chance to revise.

This needs to be done before the end of **year 1**. Students who transfer from MSc to PhD streams do not need to submit an additional proposal IF their committee thinks the original proposal satisfactory for the PhD stream. **Your committee does not need to meet in person to approve your thesis proposal. This can be done via e-mail communication.**

Progress Report #2

If you remain in the MSc stream, a second progress report meeting should be held at the 18-month mark. At this meeting, present a written outline for your MSc thesis and be ready for lots of questions. Your committee will want to gauge how ready you will be for your final oral thesis defense.

See *Supplementary Regulations*: p. 14; box 4.7.3

At this point, the next step in the MSc program will be your thesis submission (*vide infra*).

If you have transferred into the PhD stream, this progress report meeting (at 20 months) can be used to update your committee's expectations of you for your new degree program. You also may want to discuss an update to your thesis proposal if things have changed. This is also the time to complete and submit the PhD "Program of Study" form, available from the FGS website, if you have not done so already.

http://umanitoba.ca/faculties/graduate_studies/media/PhdProgramOfStudy.pdf

Candidacy Exam (PhD stream only)

See *Supplementary Regulations*: p. 25, box 5.8

This is an oral examination by your committee, normally held toward the end of your second year.

NOTE – you must be **registered** for your candidacy in **September** of the academic year in which you will take your exam, so plan ahead! Ask in the main office for more information about registration for your candidacy exam. Also, be sure to discuss your candidacy exam arrangements well ahead of time with the Chair of the GSSC.

Typically, you will give a ~30 min presentation on your research (based on slides you've circulated to your committee at least a week prior), and then be asked a series of questions (in rounds) by your committee members. The Graduate Chair or designate normally presides over the examination to maintain standards across the Department, so be sure to consult the GSSC Chair when selecting the date. The Chair will take care of the required paperwork following the exam.

When preparing for your candidacy exam, it's important to remember the point of this exercise: as the name suggests, this examination is a chance for your committee members to determine whether you are ready to be a "candidate" for a PhD. Your committee will try to see how well you not only understand the specifics of your project, but the scientific context surrounding your research area, and underlying science that serves as the foundation for what you are trying to do in the lab. This might seem pretty hard! But you know more than you think you do.

A good way to approach the candidacy exam is to think of it as a conversation amongst scientists (i.e., you and your committee members. Yes! You too are a scientist!). Your fellow scientists (your committee members) will simply try to have a chat with you about your work, one that might wander from the technical details of an experimental technique you might use, to the theoretical underpinnings for your central hypothesis, to the limitations of the way you analyze your data. It's not essential you know all the answers, but it is essential you are able to talk about your work and about the science and technology on which it is based. Keep this in mind when preparing for the examination. Definitely speak with your committee members well ahead of time for guidance on particular areas they might feel it is important you review ahead of your exam.

Last, you are meant to get something out of this exercise (aside from a passing grade). Your candidacy exam should help you identify areas you are strong in, as well as those that you can improve in, well in advance of your final PhD examination. It is also meant to give you a chance to practice explaining technical and scientific concepts to an educated audience, a skill that should serve you well whatever you do following your graduate studies!

Your committee will evaluate your performance (including how you answer questions, both those you know the answer to and those you don't) on a pass/fail basis and the decision to pass must be unanimous.

Colloquium/Departmental Research Seminar (PhD stream only)

See Supplementary Regulations, p 23, box 5.4

Before the end of your **third year** (36 months), you are expected to give a research seminar to the Department as part of your degree requirements. These presentations are held on **Monday afternoons at 3:30 pm, generally in 201 Armes though the room may be subject to availability**. All graduate students are expected to attend ALL presentations. Support your fellow students by attending and asking questions!

Be sure to contact the Graduate Chair in the summer prior to schedule your seminar slot. When choosing your date, remember it is required that everyone from your committee attend in person. So be sure to discuss potential dates with your committee members before committing to one with the seminar coordinator.

The content of this talk should be the background to and results from your own original research. Your committee will evaluate your performance (including how you answer questions) on a pass/fail basis. Be sure that your committee signs the Department "PhD Colloquium Report" form and that you submit this form to FGS following your seminar.

http://umanitoba.ca/faculties/science/departments/chemistry/about_chem/2140.html

Progress Report #3 – Thesis Outline (PhD stream only)

See Supplementary Regulations, p 25, box 5.6

Three years (36 months) in, you should present to your committee a **thesis outline**. This should take the form of a rough outline of the chapters of the thesis, published/submitted/in preparation manuscripts to include (for sandwich theses) and a timeline of how you will complete it. If you are going to go the sandwich thesis route (i.e., write an introduction, conclusion sandwiching manuscripts you have written yourself), discuss this with your committee and gain their approval first. Your committee should use this meeting to gauge your readiness for your final oral examination. Be prepared for some tough questions!

THESIS SUBMISSION AND DEFENSE

You made it! Sort of... Here's what you still need to do...

MSc Thesis Submission and Defense

Remember, while your advisor should help you arrange your thesis submission and defence, it is ultimately your responsibility (the student) that all specific procedures are followed. They are:

1. The Advisor should read the thesis and provide feedback to the Student. The Advisor must approve the thesis (quality, content) before it is submitted to the Department.
2. An electronic copy of the thesis is provided to the Graduate Chair along with a completed "Appointment of Examiners" form identifying the committee members. The Examining Committee will normally be the same as the Advisory Committee who has followed the Student's progress throughout their degree. Substitutions will be considered under special circumstances such as sabbatical leaves. The Graduate Chair will distribute the thesis to the members of the Examining Committee.

http://umanitoba.ca/faculties/graduate_studies/media/thesis_title_examiners-masters.pdf

It is best to leave 3-4 weeks for this process and more time during the summer. If the committee agrees to expedite the process, it is possible to do this on a shorter timeline. It is ultimately the student's responsibility to check everyone's schedules to ensure that their thesis is completed within the timeframe he/she envisions.

3. Committee members should make every effort to read the thesis within 3 weeks (as is done at the PhD level). Once the thesis has been read, each committee member should send a short report via email to the Graduate Chair, Advisor and Student. This should briefly outline the strengths/weaknesses of the thesis and state whether the thesis is of sufficient quality to proceed to the oral defence stage. FGS asks for the following categorization at the MSc level:

- Acceptable, without modification or with minor revision(s); or
- Acceptable, subject to modification and/or revision(s); or
- Not acceptable

If major revisions are anticipated, the report should outline these changes so that the Student can begin to address these regardless of whether the defense is to be scheduled or not at this stage. Two or more dissenting voices counts as a failure as per FGS regulations.

4. Once all members of the committee have responded, the Graduate Chair will notify the Advisor to schedule the oral examination.

a) The Advisor will appoint a Chair (Member of FGS not on the Examining Committee). The name of the Chair should be sent to the Graduate Chair so that the regulations and paperwork can be distributed ahead of the exam to the appropriate person.

b) The Advisor/Student should provide the main office with the date/time and the title of thesis in order to book the room and advertise the event.

Students and committees are encouraged to work towards their own private deadline but the defence will not be scheduled and advertised until the above steps are completed.

5. On the day of the oral examination, the Advisor may introduce the candidate but the Chair will oversee the exam and paperwork. As MSc exams are now open to the public, questions from the audience should be held to the end as is done in PhD exams. You will give a 25-30 min presentation on your work and this will be followed by questions from your committee (usually ~ 90 min).

Any questions, ask your advisor first, and consult with the Graduate Chair if necessary.

PhD Thesis Submission and Defense

See Supplementary Regulations: p 28, box 5.10

Chemistry allows 'sandwich theses' - i.e., theses that use published papers as individual chapters. You must have approval from your committee about this if you choose to go this route.

The FGS regulations have very detailed instructions for your PhD thesis and defense. Read these! Distribution of the thesis to committee members and scheduling of the oral exam is handled by FGS directly.

For details about the Defense itself: see Supplementary Regulations: p 28, box 5.11

Should be held near the end of your fourth year. In reality, most students take somewhere between 4-5 years to complete.

Speak to your advisor to set out a timeline for thesis submission/defense.

Examining committee: your advisory committee + an external (to the university) examiner. Your advisor will provide names of suitable examiners to FGS who will select this person directly.

See **section 5.11.2** of the 'Academic Guide' available under 'Faculty and Staff' on the FGS website: http://umanitoba.ca/faculties/graduate_studies/index.html

Submitting Your PhD Thesis

Step 1. Prior to official submission, your PhD advisory committee is responsible for reviewing a candidate's thesis *in its entirety* and providing written feedback. This occurs BEFORE the student submits their thesis to the JUMP thesis portal for official review by both internal and external committee members. At this stage, be sure you have the approval of your advisor to submit your thesis to your committee.

Step 2. Once the internal review of the thesis has been completed by the advisory committee:

a. With your advisor, download the "Approval to Proceed to PhD Thesis Examination" form from the FGS website":

"Graduate Studies forms" page:

http://umanitoba.ca/faculties/graduate_studies/forms/index.html

This form should be completed and signed by you (the student), your entire advisory committee, and the Department Head/Graduate Chair verifying that:

- Advisory committee members have read the **complete** version of the thesis that the candidate intends to submit for examination and have provided the candidate with a detailed review and comments including any necessary revisions;
- The student has received feedback from all members of the advisory committee, has taken the feedback into account in preparing the thesis, and is ready and willing to have their thesis examined; and
- The department/unit fully supports the thesis proceeding to examination.

b. Next, log into the **JUMP Thesis Portal** and upload a .pdf copy of the “Approval to Proceed to PhD Thesis Examination” form and a copy of your thesis and ALL supplemental files (if applicable).

c. You (the student) will receive an email confirming that their thesis has been received. Email notification is also sent to the department/unit contact person to inform them that the student has submitted their thesis to the JUMP portal for thesis examination.

d. Email notification is then sent to the advisor/co-advisor to request that they submit the names of three (3) prospective external examiners, along with brief CVs and a justification for selecting them. Instructions and a link for submitting the prospective external examiners’ information to the JUMP portal are provided in the email. **The advisor/co-advisor and student are not permitted to contact the prospective external examiners in advance.** The external examiner will be chosen by the Faculty of Graduate Studies’ Associate Dean and will remain anonymous until the external examiner’s report is received.

e. Once the submission has been reviewed by the Faculty of Graduate Studies and an external examiner has been chosen by the Associate Dean, the thesis examination will be initiated. Email notifications will be sent to:

- Internal and external examiners providing them with a link for accessing a .pdf copy of the candidate’s thesis (and supplemental files, if applicable) and instructions for submitting their report. Examiners are requested to submit their reports within three (3) weeks. The Faculty of Graduate Studies will email individual examiners a reminder if their report hasn’t been received after three (3) weeks.

- The student and advisor/co-advisor to inform them that the thesis examination is now in progress. They are reminded that while the thesis is undergoing review, no communication is permitted with examining committee members regarding the thesis until all internal and external examiner reports have been received.

f. Once all examiner reports are received, they are distributed via email to the advisor/co-advisor, internal examining committee members and the Department/Unit Head. The advisor/co-advisor is/are asked to share the reports with the student. They are also provided with information concerning scheduling the Ph.D. Oral Defence.

These instructions can be viewed on-line under "Ph.D. thesis distribution instructions" on the FGS website:

https://umanitoba.ca/faculties/graduate_studies/thesis/index.html

Complete information regarding the Ph.D. thesis examination process and procedures can be viewed in "SECTION 5: Doctor of Philosophy General Regulations":

<http://crscalprod.ad.umanitoba.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=380&chapterid=4550&topicroupid=23962&loaduseredits=False>

For any questions or further assistance, contact the Chemistry/Science **Student Program Assistant** in the Faculty of Graduate Studies:

https://umanitoba.ca/faculties/graduate_studies/aboutus/staff.html

OTHER RESOURCES AND WHERE TO FIND THEM

CHEMISTRY LIBRARY SUBJECT GUIDE

<http://libguides.lib.umanitoba.ca/chemistry>

STUDENT COUNSELLING SERVICES

<http://umanitoba.ca/student/counselling/services.html>

LINKS FOR INTERNATIONAL STUDENTS

http://umanitoba.ca/faculties/graduate_studies/admissions/international.html

INTERNATIONAL CENTRE FOR STUDENTS

<http://umanitoba.ca/student/ics/>

LANGUAGE AND LEARNING SERVICES (e.g., TUTORING)

<http://umanitoba.ca/student/academiclearning/>

INDIGENOUS STUDENT RESOURCES

<http://umanitoba.ca/student/indigenous/>

SAGE: Supporting Aboriginal Graduate Enhancement

<http://umanitoba.ca/student/indigenous/SAGE.html>

Contact: Dr. Justin Rasmussen - Justin.Rasmussen@umanitoba.ca - Migizii Agamik (Indigenous Student Centre, ISC)

OUTREACH OPPORTUNITIES

Your time as graduate student will ultimately be measured by more than just what you do in the lab or classroom. This is true for your own personal growth, as well as for your CV – employers more and more are looking for experience that demonstrate ‘soft skills’ such as communication skills, in addition to technical expertise. Outreach within the local community is a great way to hone your ability to explain scientific concepts to novices and can teach you a lot as well! As Nobel laureate Irving Langmuir once was supposedly quoted as saying, “Anyone who can’t explain what they do to a 14-year old is a charlatan.” So get involved!

Let’s Talk Science – general science outreach, <http://outreach.letstalkscience.ca/umanitoba.html>, contact Horace.Luong@umanitoba.ca for more information

Science Rendezvous – annual, one day science outreach event, <http://www.sciencerendezvous.ca/university-of-manitoba/>, contact James.Xidos@umanitoba.ca for more information

WISE: Women in Science and Engineering – Kidnetic Outreach program
http://umanitoba.ca/faculties/engineering/alumni_community/alumcomm_wise.html

SHArK: Solar Hydrogen Activity Research Kit, Renewable Energy Outreach Program with Winnipeg-area high school students (currently, Daniel MacIntyre Collegiate Institute and Grant Park) – contact david.herbert@umanitoba.ca for more information